OIPE JC118
JUN 23 2005
PATENT & TRADEMARK OFFICE

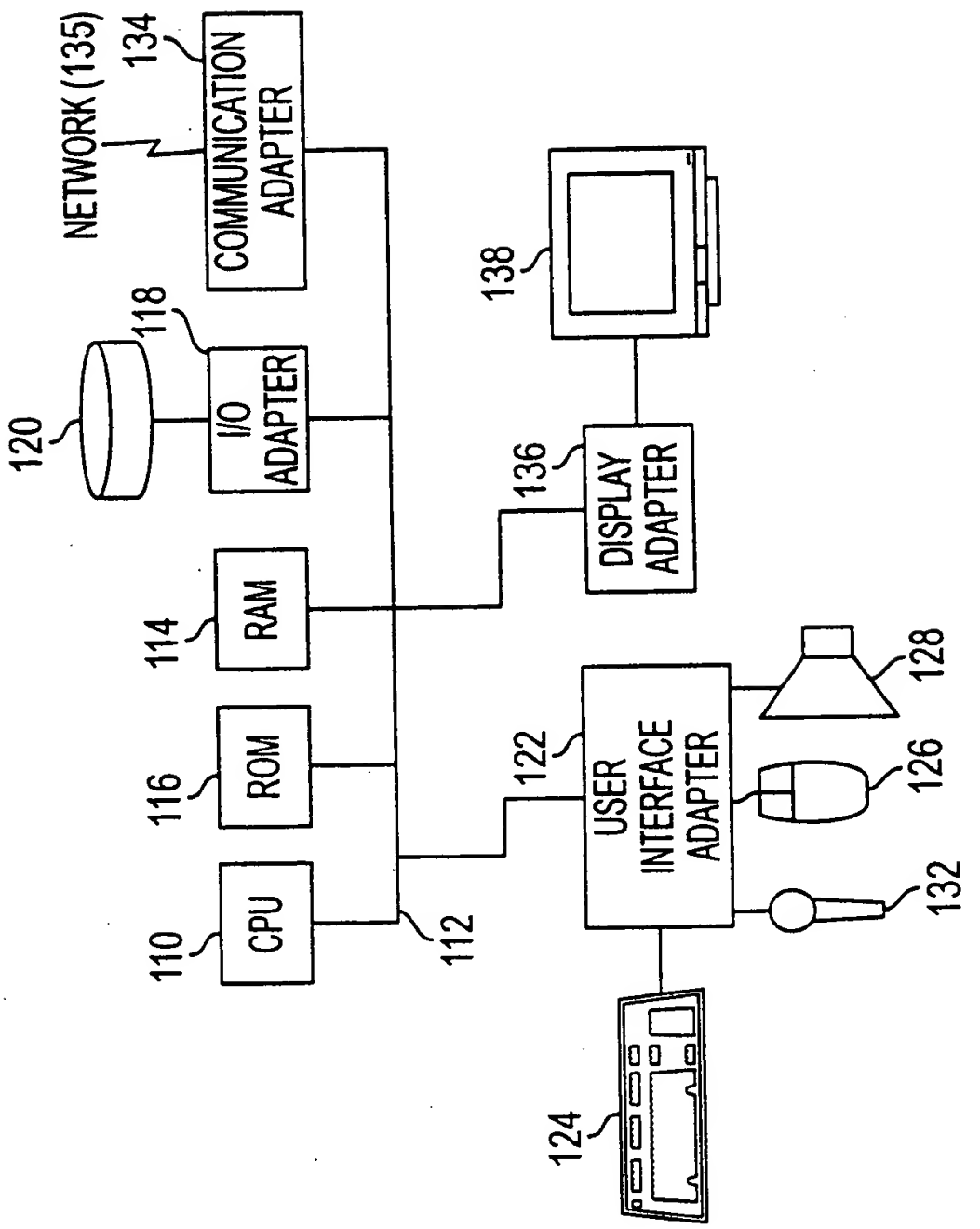


FIG. 1

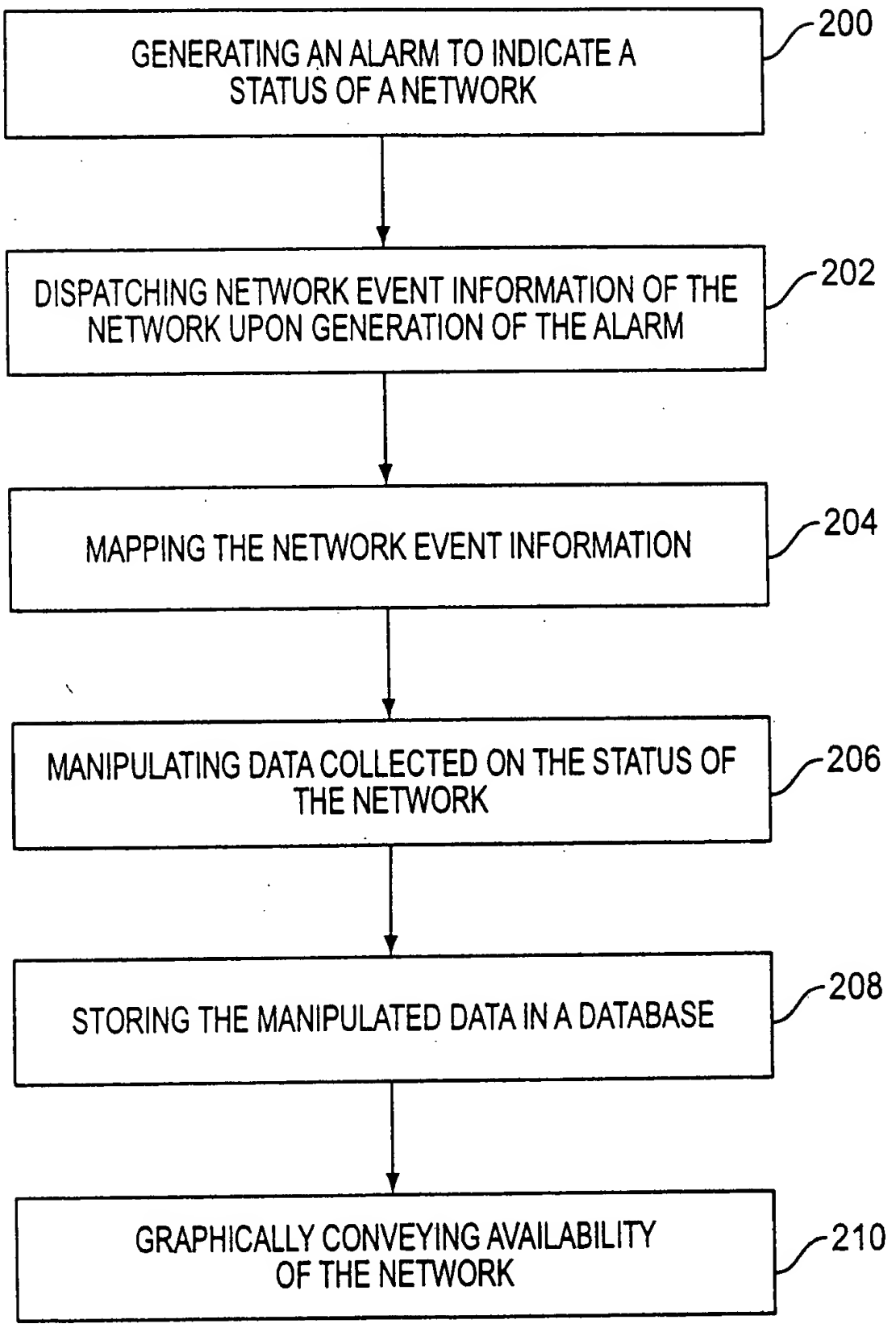

GENERATING AN ALARM TO INDICATE A STATUS OF A NETWORK
200
DISPATCHING NETWORK EVENT INFORMATION OF THE NETWORK UPON GENERATION OF THE ALARM
202
MAPPING THE NETWORK EVENT INFORMATION
204
MANIPULATING DATA COLLECTED ON THE STATUS OF THE NETWORK
206
STORING THE MANIPULATED DATA IN A DATABASE
208
GRAPHICALLY CONVEYING AVAILABILITY OF THE NETWORK
210

FIG. 2

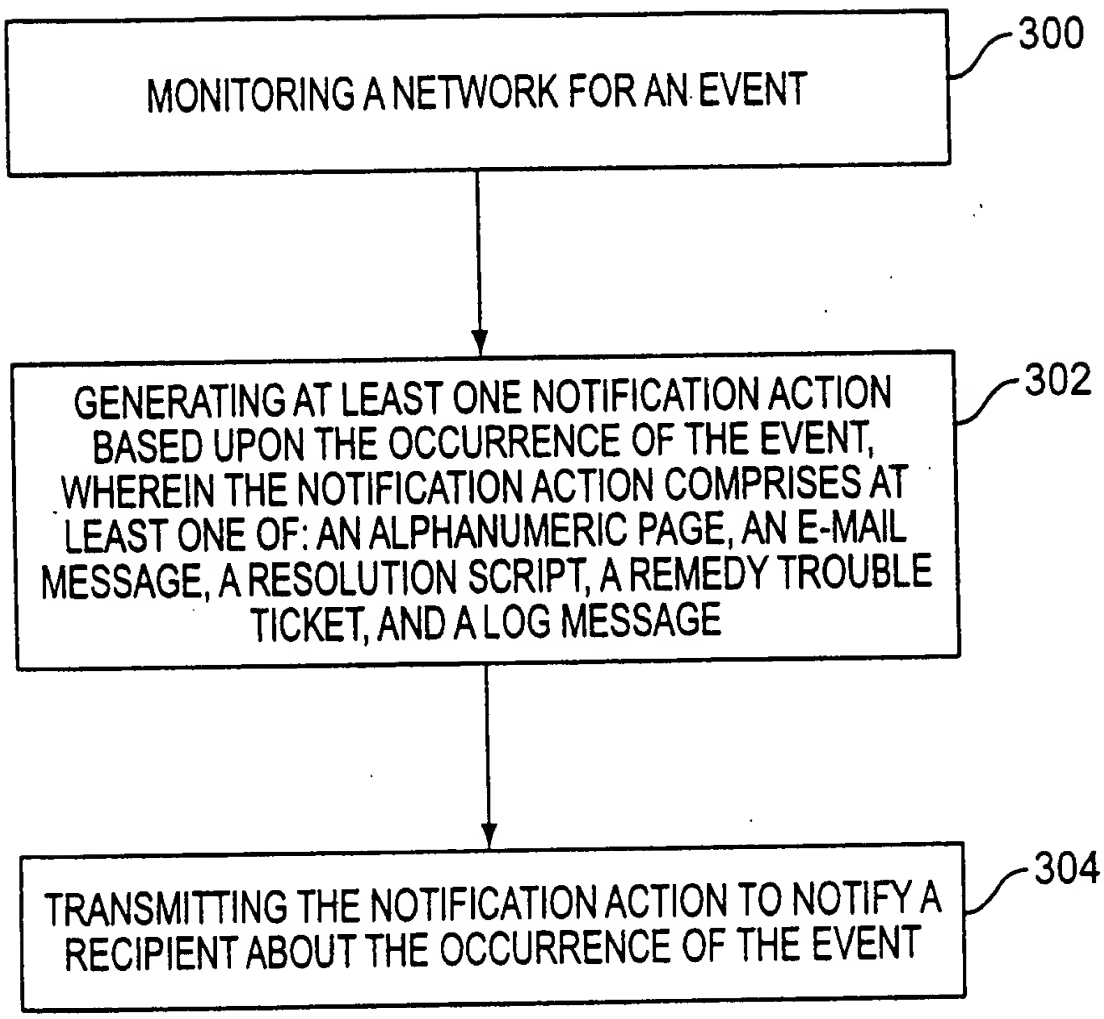

MONITORING A NETWORK FOR AN EVENT
300
GENERATING AT LEAST ONE NOTIFICATION ACTION BASED UPON THE OCCURRENCE OF THE EVENT, WHEREIN THE NOTIFICATION ACTION COMPRISES AT LEAST ONE OF: AN ALPHANUMERIC PAGE, AN E-MAIL MESSAGE, A RESOLUTION SCRIPT, A REMEDY TROUBLE TICKET, AND A LOG MESSAGE
302
TRANSMITTING THE NOTIFICATION ACTION TO NOTIFY A RECIPIENT ABOUT THE OCCURRENCE OF THE EVENT
304

FIG. 3

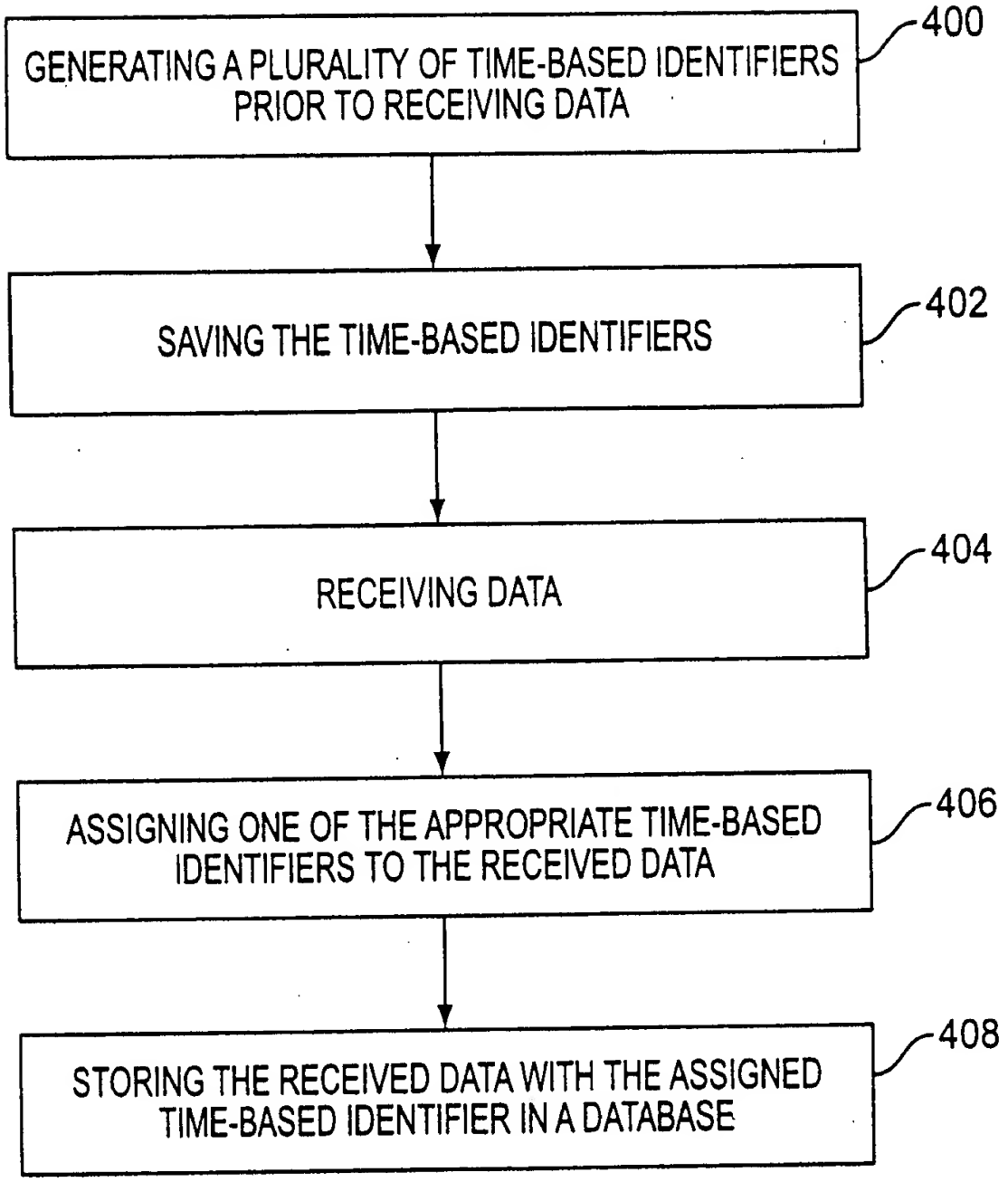

GENERATING A PLURALITY OF TIME-BASED IDENTIFIERS PRIOR TO RECEIVING DATA
400
SAVING THE TIME-BASED IDENTIFIERS
402
RECEIVING DATA
404
ASSIGNING ONE OF THE APPROPRIATE TIME-BASED IDENTIFIERS TO THE RECEIVED DATA
406
STORING THE RECEIVED DATA WITH THE ASSIGNED TIME-BASED IDENTIFIER IN A DATABASE
408

FIG. 4

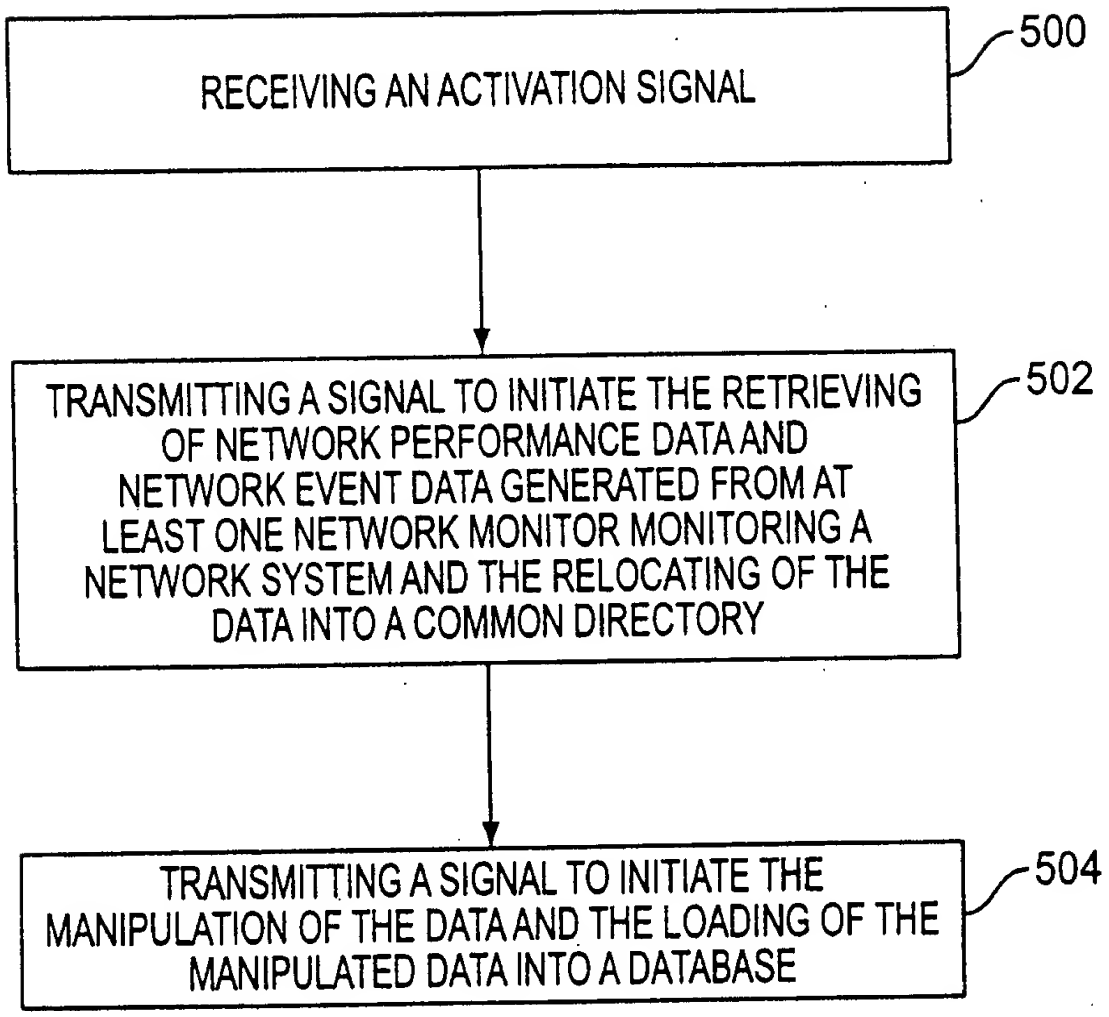

RECEIVING AN ACTIVATION SIGNAL
500
TRANSMITTING A SIGNAL TO INITIATE THE RETRIEVING OF NETWORK PERFORMANCE DATA AND NETWORK EVENT DATA GENERATED FROM AT LEAST ONE NETWORK MONITOR MONITORING A NETWORK SYSTEM AND THE RELOCATING OF THE DATA INTO A COMMON DIRECTORY
502
TRANSMITTING A SIGNAL TO INITIATE THE MANIPULATION OF THE DATA AND THE LOADING OF THE MANIPULATED DATA INTO A DATABASE
504

FIG. 5

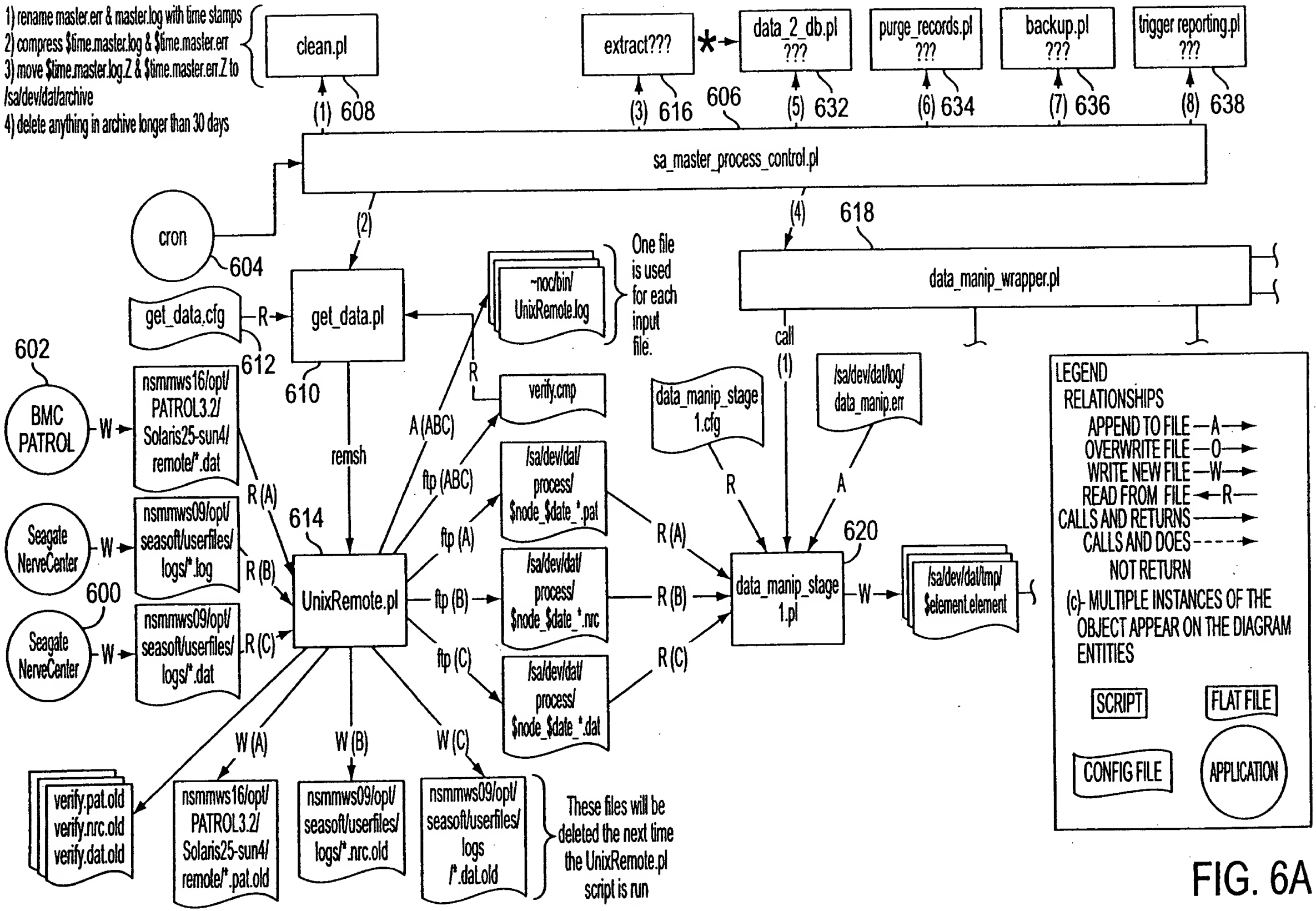

1) rename master.err & master.log with time stamps
2) compress $time.master.log & $time.master.err
3) move $time.master.log.Z & $time.master.err.Z to /sa/dev/dat/archive
4) delete anything in archive longer than 30 days
clean.pl
(1) 608
extract???
(3) 616
data_2_db.pl ???
(5) 632
purge_records.pl ???
(6) 634
backup.pl ???
(7) 636
trigger reporting.pl ???
(8) 638
606
sa_master_process_control.pl
cron
604
(2)
(4) 618
data_manip_wrapper.pl
get_data.cfg
R
612
get_data.pl
610
~noc/bin/ UnixRemote.log
One file is used for each input file.
602
BMC PATROL
W
nsmmws16/opt/ PATROL3.2/ Solaris25-sun4/ remote/*.dat
R (A)
remsh
R
verify.cmp
A (ABC)
ftp (ABC)
data_manip_stage 1.cfg
/sa/dev/dat/log/ data_manip.err
call (1)
LEGEND
RELATIONSHIPS
APPEND TO FILE —A→
OVERWRITE FILE —O→
WRITE NEW FILE —W→
READ FROM FILE ←R—
CALLS AND RETURNS →
CALLS AND DOES - - - →
NOT RETURN
(c)- MULTIPLE INSTANCES OF THE OBJECT APPEAR ON THE DIAGRAM ENTITIES
SCRIPT
FLAT FILE
CONFIG FILE
APPLICATION
Seagate NerveCenter
W
nsmmws09/opt/ seasoft/userfiles/ logs/*.log
R (B)
614
UnixRemote.pl
ftp (A)
/sa/dev/dat/ process/ $node_$date_*.pat
R (A)
600
Seagate NerveCenter
W
nsmmws09/opt/ seasoft/userfiles/ logs/*.dat
R (C)
ftp (B)
/sa/dev/dat/ process/ $node_$date_*.nrc
R (B)
ftp (C)
/sa/dev/dat/ process/ $node_$date_*.dat
R (C)
R
A
620
data_manip_stage 1.pl
W
/sa/dev/dat/tmp/ $element.element
W (A)
W (B)
W (C)
verify.pat.old
verify.nrc.old
verify.dat.old
nsmmws16/opt/ PATROL3.2/ Solaris25-sun4/ remote/*.pat.old
nsmmws09/opt/ seasoft/userfiles/ logs/*.nrc.old
nsmmws09/opt/ seasoft/userfiles/ logs /*.dat.old
These files will be deleted the next time the UnixRemote.pl script is run

FIG. 6A

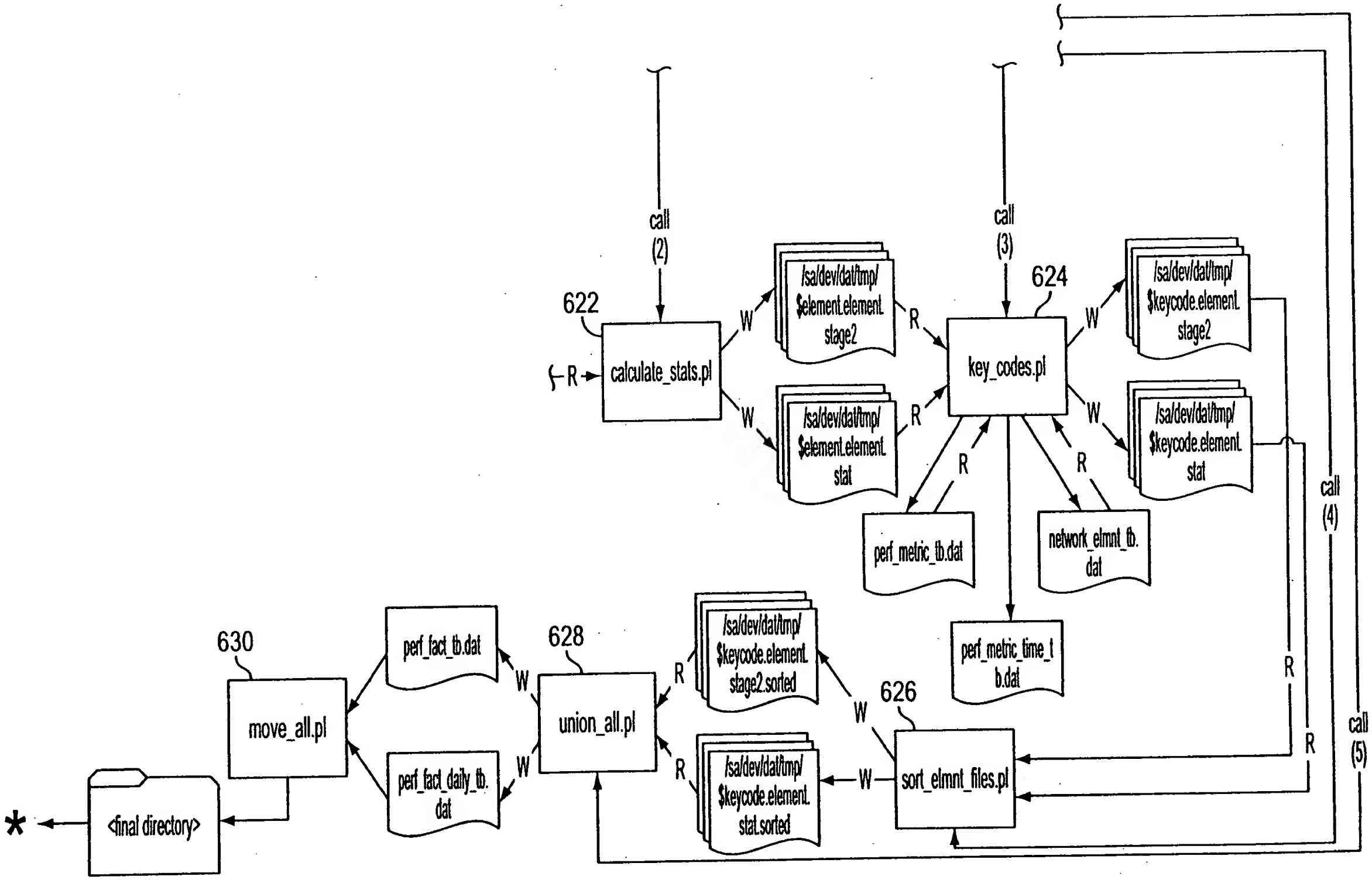

call
(2)
622
calculate_stats.pl
R
W
/sa/dev/dat/tmp/
$element.element.
stage2
/sa/dev/dat/tmp/
$element.element.
stat
call
(3)
624
key_codes.pl
R
W
/sa/dev/dat/tmp/
$keycode.element.
stage2
/sa/dev/dat/tmp/
$keycode.element.
stat
perf_metric_tb.dat
network_elmnt_tb.
dat
perf_metric_time_t
b.dat
call
(4)
call
(5)
630
move_all.pl
perf_fact_tb.dat
perf_fact_daily_tb.
dat
628
union_all.pl
/sa/dev/dat/tmp/
$keycode.element.
stage2.sorted
/sa/dev/dat/tmp/
$keycode.element.
stat.sorted
626
sort_elmnt_files.pl
*
<final directory>

FIG. 6B

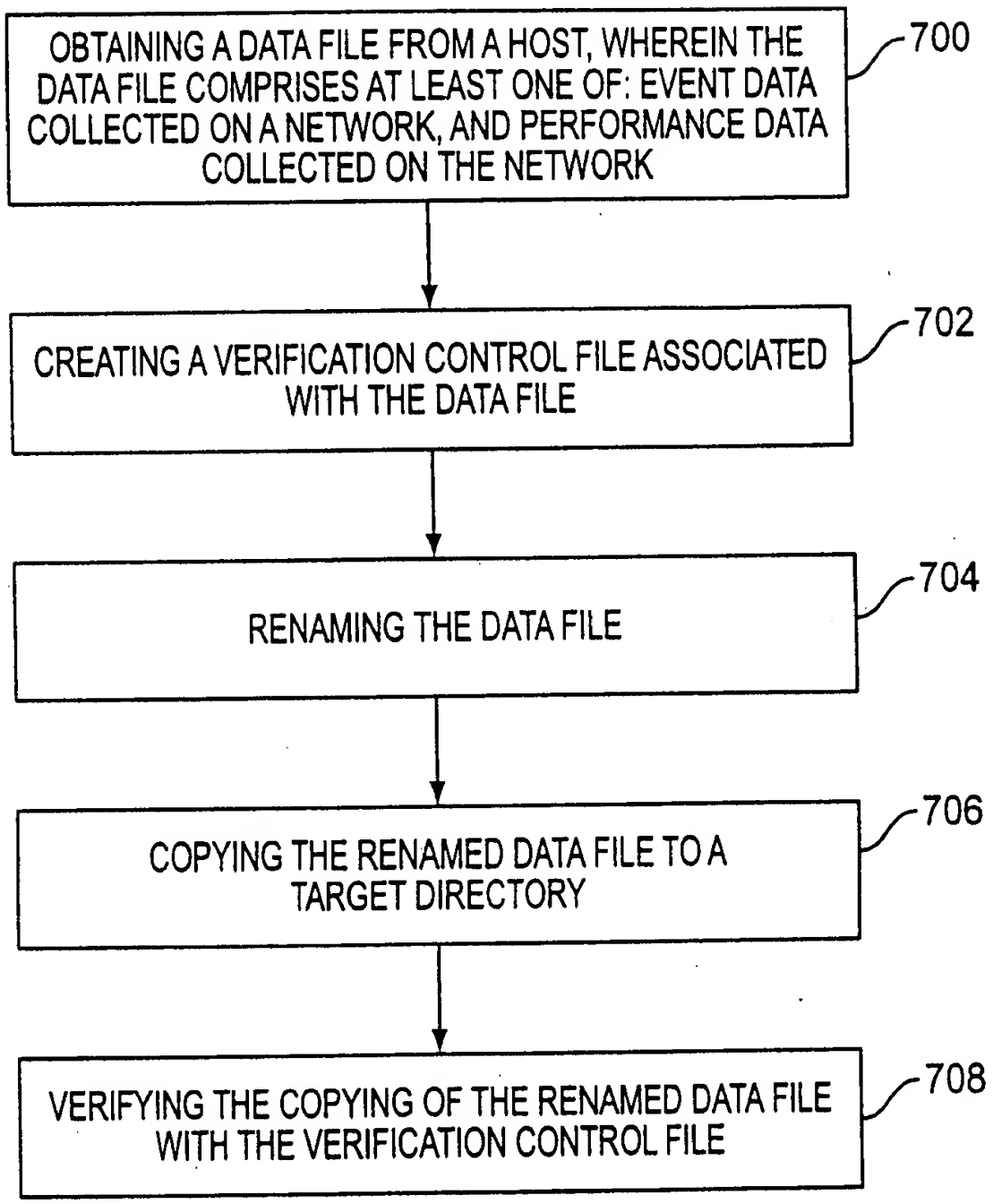

OBTAINING A DATA FILE FROM A HOST, WHEREIN THE DATA FILE COMPRISES AT LEAST ONE OF: EVENT DATA COLLECTED ON A NETWORK, AND PERFORMANCE DATA COLLECTED ON THE NETWORK
700
CREATING A VERIFICATION CONTROL FILE ASSOCIATED WITH THE DATA FILE
702
RENAMING THE DATA FILE
704
COPYING THE RENAMED DATA FILE TO A TARGET DIRECTORY
706
VERIFYING THE COPYING OF THE RENAMED DATA FILE WITH THE VERIFICATION CONTROL FILE
708

FIG. 7

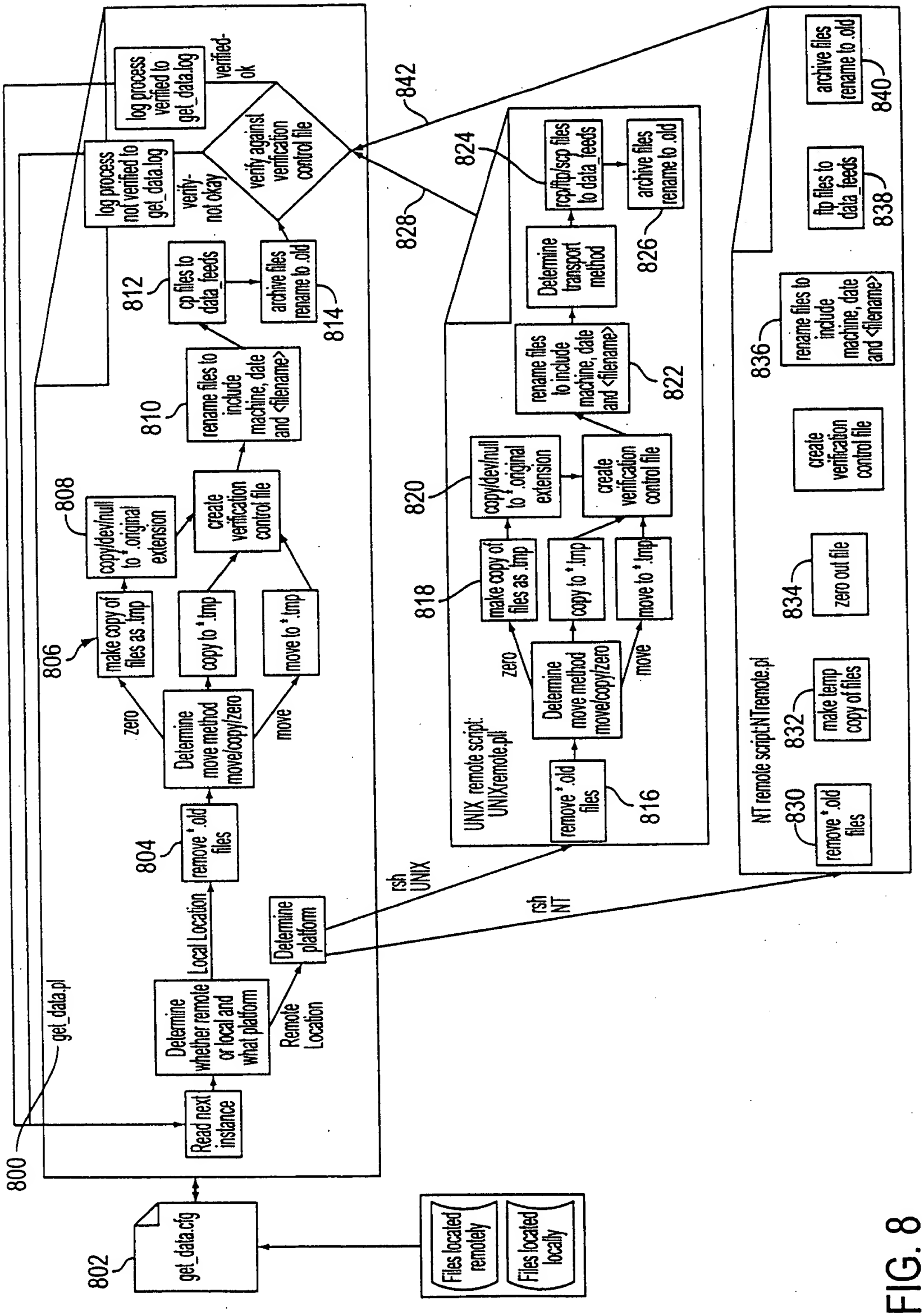

800
get_data.pl
802
get_data.cfg
Files located remotely
Files located locally
Read next instance
Determine whether remote or local and what platform
Local Location
Remote Location
Determine platform
804
remove *.old files
Determine move method move/copy/zero
zero
move
806
make copy of files as .tmp
copy to *.tmp
move to *.tmp
808
copy/dev/null to *.original extension
create verification control file
810
rename files to include machine, date and <filename>
812
cp files to data_feeds
archive files rename to .old
814
verify against verification control file
verified-ok
verify-not okay
log process verified to get_data.log
log process not verified to get_data.log
816
UNIX remote script: UNIXremote.pl
rsh UNIX
818
820
822
824
826
828
rcp/ftp/scp files to data_feeds
archive files rename to .old
842
NT remote script:NTremote.pl
rsh NT
830
832
834
836
838
840
zero out file
create verification control file
rename files to include machine, date and <filename>
ftp files to data_feeds
archive files rename to .old

FIG. 8

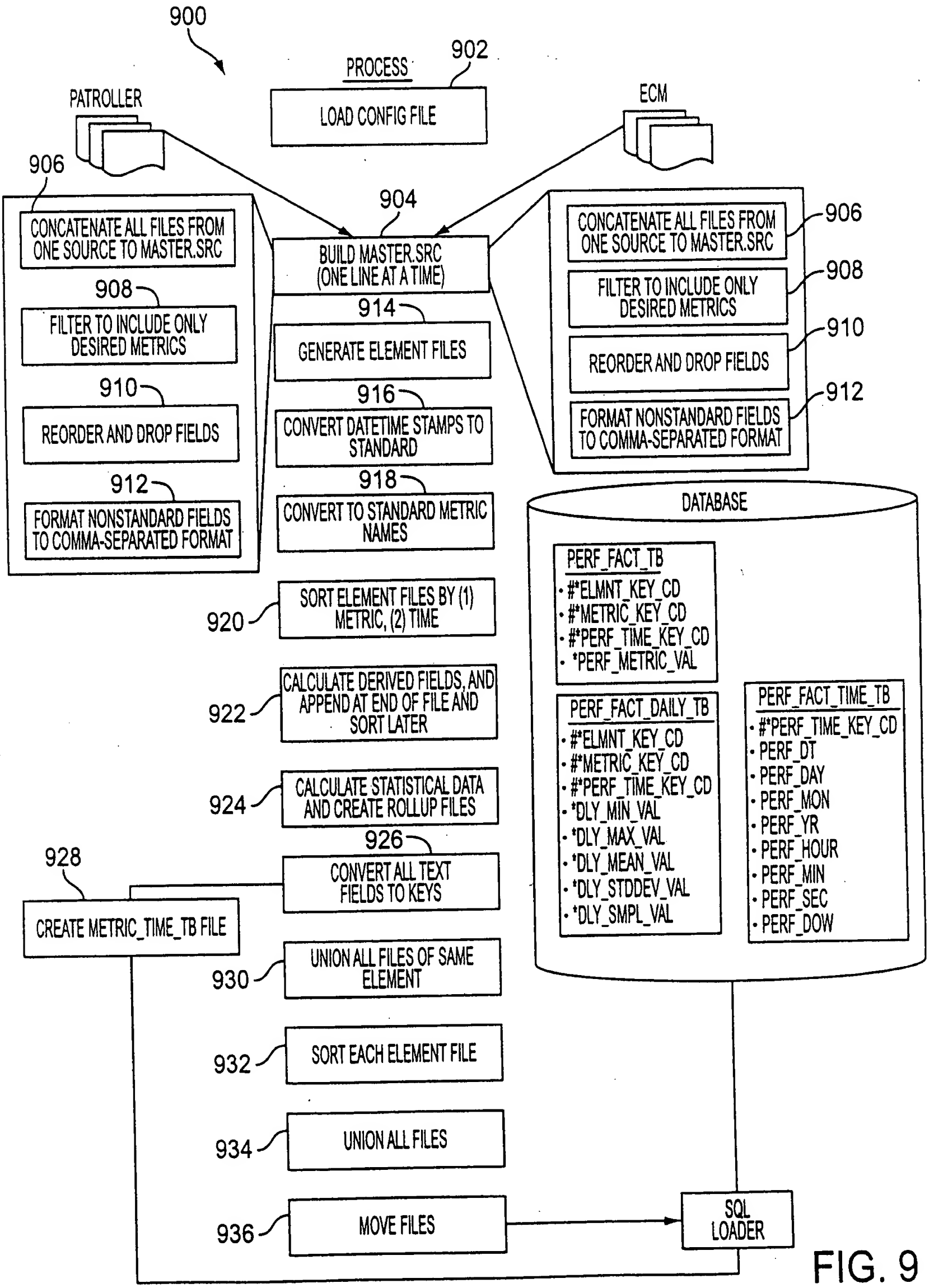

900
PROCESS
902
LOAD CONFIG FILE
PATROLLER
ECM
906
CONCATENATE ALL FILES FROM ONE SOURCE TO MASTER.SRC
908
FILTER TO INCLUDE ONLY DESIRED METRICS
910
REORDER AND DROP FIELDS
912
FORMAT NONSTANDARD FIELDS TO COMMA-SEPARATED FORMAT
904
BUILD MASTER.SRC (ONE LINE AT A TIME)
914
GENERATE ELEMENT FILES
916
CONVERT DATETIME STAMPS TO STANDARD
918
CONVERT TO STANDARD METRIC NAMES
CONCATENATE ALL FILES FROM ONE SOURCE TO MASTER.SRC
906
FILTER TO INCLUDE ONLY DESIRED METRICS
908
REORDER AND DROP FIELDS
910
FORMAT NONSTANDARD FIELDS TO COMMA-SEPARATED FORMAT
912
DATABASE
PERF_FACT_TB
• #*ELMNT_KEY_CD
• #*METRIC_KEY_CD
• #*PERF_TIME_KEY_CD
• *PERF_METRIC_VAL
PERF_FACT_DAILY_TB
• #*ELMNT_KEY_CD
• #*METRIC_KEY_CD
• #*PERF_TIME_KEY_CD
• *DLY_MIN_VAL
• *DLY_MAX_VAL
• *DLY_MEAN_VAL
• *DLY_STDDEV_VAL
• *DLY_SMPL_VAL
PERF_FACT_TIME_TB
• #*PERF_TIME_KEY_CD
• PERF_DT
• PERF_DAY
• PERF_MON
• PERF_YR
• PERF_HOUR
• PERF_MIN
• PERF_SEC
• PERF_DOW
920
SORT ELEMENT FILES BY (1) METRIC, (2) TIME
922
CALCULATE DERIVED FIELDS, AND APPEND AT END OF FILE AND SORT LATER
924
CALCULATE STATISTICAL DATA AND CREATE ROLLUP FILES
926
CONVERT ALL TEXT FIELDS TO KEYS
928
CREATE METRIC_TIME_TB FILE
930
UNION ALL FILES OF SAME ELEMENT
932
SORT EACH ELEMENT FILE
934
UNION ALL FILES
936
MOVE FILES
SQL LOADER

FIG. 9

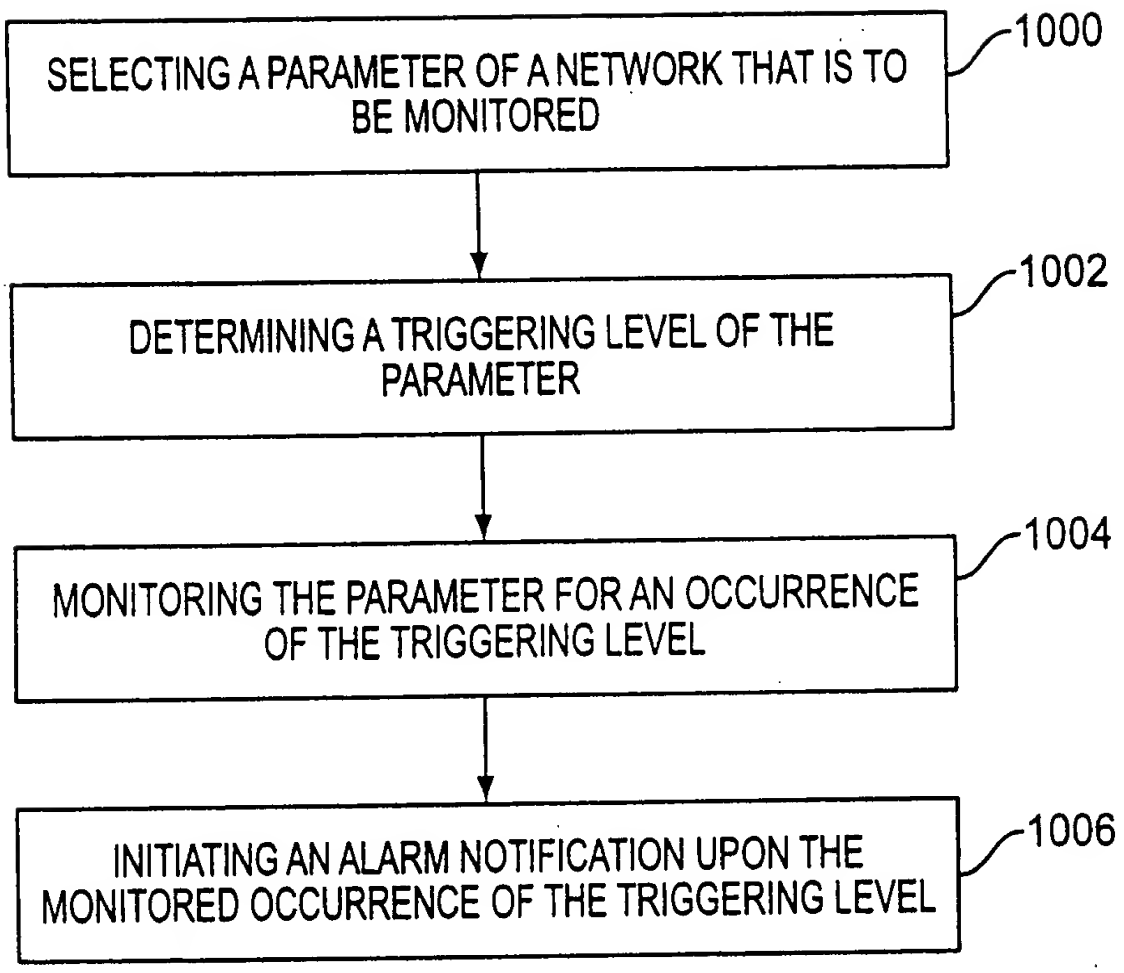

SELECTING A PARAMETER OF A NETWORK THAT IS TO BE MONITORED
1000
DETERMINING A TRIGGERING LEVEL OF THE PARAMETER
1002
MONITORING THE PARAMETER FOR AN OCCURRENCE OF THE TRIGGERING LEVEL
1004
INITIATING AN ALARM NOTIFICATION UPON THE MONITORED OCCURRENCE OF THE TRIGGERING LEVEL
1006

FIG. 10

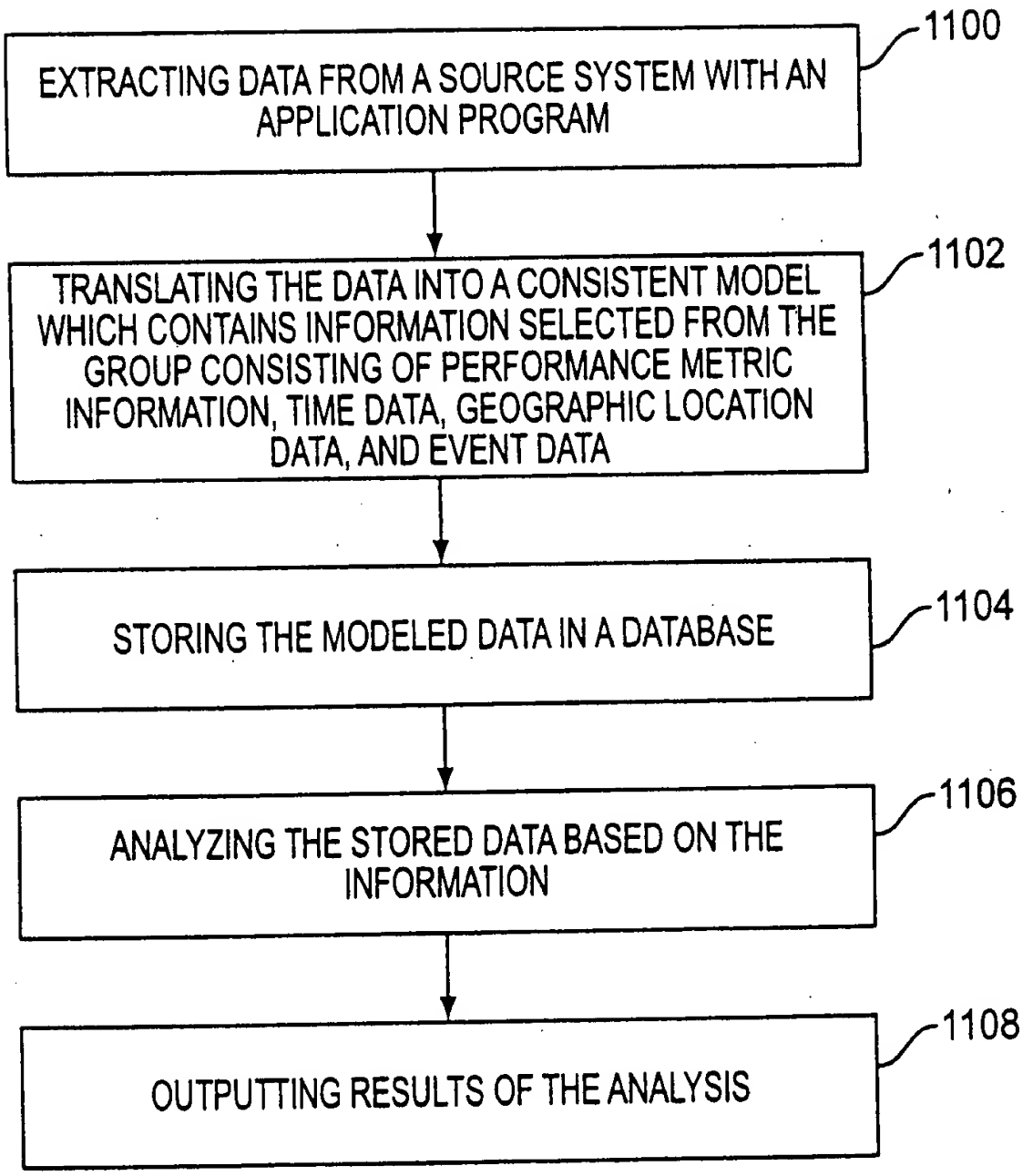

EXTRACTING DATA FROM A SOURCE SYSTEM WITH AN APPLICATION PROGRAM
1100
TRANSLATING THE DATA INTO A CONSISTENT MODEL WHICH CONTAINS INFORMATION SELECTED FROM THE GROUP CONSISTING OF PERFORMANCE METRIC INFORMATION, TIME DATA, GEOGRAPHIC LOCATION DATA, AND EVENT DATA
1102
STORING THE MODELED DATA IN A DATABASE
1104
ANALYZING THE STORED DATA BASED ON THE INFORMATION
1106
OUTPUTTING RESULTS OF THE ANALYSIS
1108

FIG. 11

TABLESPACE	DEFAULT STATUS	PHYSICAL REQUIREMENTS	RELATED TABLESPACES/ RELATIONSHIPS	DATAFILE	DATAFILE SIZE (MB)	OPERATING SYSTEM	DATABASE ID	ENTITY LOCATION
IPSADAT01	On-Line	Data only-No indexes	IPSAIDX/Index tablespace	/files5/oradata/IPSA01/IPSA01ipsadat01.dat	100	HP-UX 10.2	IPSA01	
IPSAIDX	On-Line	Index only	IPSADAT01/data tablespace	/files4/oradata/IPSA01/IPSA01idx01.dbf	20	HP-UX 10.2	IPSA01	
SYSTEM	On-Line		ALL	/files1/oradata/IPSA01/IPSA01system01.dbf	60	HP-UX 10.2	IPSA01	
TEMP01	On-Line		ALL	/files3/oradata/IPSA01/IPSA01tmp01.dbf	20	HP-UX 10.2	IPSA01	
RBS01	On-Line	Contains the 4 rollback segments for the database	ALL	/files2/oradata/IPSA01/IPSA01rbs01.dbf	30	HP-UX 10.2	IPSA01	

FIG. 12

Replacement Drawings
Serial No. 09/471,777

ELEMENTS	2,000	2,500	5,000	10,000	20,000	50,000
AVERAGE METRICS/ELEMENT	10	10	10	10	10	10
POLL FREQUENCY	100	100	100	100	100	100
DETAIL DATA RETENTION	40	40	40	40	40	40
DAILY ROLLUP DATA RETENTION	400	400	400	400	400	400
DETAIL RECORDS/DAY	2,000,000	2,500,000	5,000,000	10,000,000	20,000,000	50,000,000
TOTAL DETAIL RECORDS	80,000,000	100,000,000	200,000,000	400,000,000	800,000,000	2,000,000,000
DAILY ROLLUP RECORDS/DAY	20,000	25,000	50,000	100,000	200,000	500,000
TOTAL DAILY ROLLUP RETAINED	8,000,000	10,000,000	20,000,000	40,000,000	80,000,000	200,000,000
TOTAL RECORDS	**88,000,000**	**110,000,000**	**220,000,000**	**440,000,000**	**880,000,000**	**2,200,000,000**
TOTAL SPACE/TABLE (BYTES)						
ELMNT_LOC_TB	90,000	112,500	225,000	450,000	900,000	2,250,000
NETWORK_ELMNT_TB	204,000	255,000	510,000	1,020,000	2,040,000	5,100,000
PERF_FACT_DAILY_TB	208,000,000	260,000,000	520,000,000	1,040,000,000	2,080,000,000	5,200,000,000
PERF_FACT_TB	3,280,000,000	4,100,000,000	8,200,000,000	16,400,000,000	32,800,000,000	82,000,000,000
PERF_METRIC_TIME_TB	1,285,632,000	1,285,632,000	1,285,632,000	1,285,632,000	1,285,632,000	1,285,632,000
PERF_METRIC_TB	1,638	1,638	1,638	1,638	1,638	1,638
TOTAL SPACE NEEDED (BYTES)	**4,773,927,638**	**5,646,001,138**	**10,006,368,638**	**18,727,103,638**	**36,168,573,638**	**88,492,983,638**
TOTAL SPACE NEEDED (MB)	**4,662.04**	**5,513.67**	**9,771.84**	**18,288.19**	**35,320.87**	**86,418.93**

FIG. 13

TABLE	COLUMN	DATA TYPE	COULMN SIZE (BYTES)	ROW SIZE (BYTES)	SPACE USED/ ROW (BYTES)
ELMNT_LOC_TB	ELMNT_LOC_CD	Varchar2(5)	6		
	ELMNT_CITY_NM	Varchar2(30)	31		
	ELMNT_STATE_DBRV	Varchar2(2)	3	43	45
EVENT_CD_TB	EVENT_CD				
	EVENT_STRING				
	EVENT_AVAIL_TYPE				
	EVENT_PAIR			3	11
EVENTS_FACT_TB	ELMNT_KEY_CD	Number(10)	7		
	PERF_TIME_KEY_CD	Number(10)	7		
	EVENT_CD				
	EVENT_DURATION				
	EVENT_SEVERITY				
	EVENT_CLASS			17	19
NETWORK_ELMNT_TB	ELMNT_KEY_CD	Number(10)	7		
	ELMNT_NM	Varchar2(20)	21		
	ELMNT_TYPE_CD	Varchar2(2)	3		
	ELMNT_VNDR_NM	Varchar2(30)	31		
	ELMNT_VNDR_MDL	Varchar2(20)	21		
	ELMNT_VAL_DT	Date	8		
	ELMNT_LOC_CD	Varchar2(5)	6	100	102
PERF_FACT_DAILY_TB	ELMNT_KEY_CD	Number(10)	7		
	METRIC_KEY_CD	Number(10)	7		
	PERF_TIME_KEY_CD	Number(10)	7		
	DLY_MIN_AMT				
	DLY_MAX_AMT				
	DLY_MEAN_AMT				
	DLY_MEDIAN_AMT				
	DLY_STDDEV_AMT			24	26
PERF_FACT_TB	ELMNT_KEY_CD	Number(10)	7		
	PERF_TIME_KEY_CD	Number(10)	7		
	METRIC_KEY_CD	Number(10)	7		
	PERF_METRIC_VAL	Number(25,5)	15	39	41
PERF_METRIC_TB	METRIC_KEY_CD	Number(10)	7		
	METRIC_NM	Varchar2(30)	31		
	METRIC_SRC	Varchar2(20)	21		
	METRIC_INS	Varchar2(30)	31		
	METRIC_SUB_INS	Varchar2(30)	31	124	126
PERF_METRIC_TIME_TB	PERF_TIME_KEY_CD	Number(10)	7		
	PERF_DT	Date	8		
	PERF_DAY	Number(2)	2		
	PERF_MON	Number(2)	2		
	PERF_YR	Number(4)	3		
	PERF_HOUR	Number(2)	2		
	PERF_MIN	Number(2)	2		
	PERF_SEC	Number(2)	2		
	PERF_DOW	Varchar2(9)	10	370	372

FIG. 14

	TIME TO LOAD (DIRECT)	TIME TO LOAD (CONVENTIONAL)	NUMBER OF ROWS LOADED	AMOUNT OF DATA (MB)	COMMENTS
EMPTY TABLE	00:04:32	00:30:12	1,048,576	35	
1 MIL ROWS IN TABLE	00:06:29	00:32:57	1,048,576	35	INDEX WAS 10 MB LARGER FOR CONVENTIONAL LOAD. THIS SUGGEST SOME DEGREE OF FRAGMENTATION OCCURRED DURING LOAD WHICH WOULD REQUIRE WEEKLY INDEX MAINTENANCE
EMPTY TABLE	00:14:49	01:31:47	3,145,728	106	
2 MIL ROWS IN TABLE	00:08:49	00:35:49	1,048,576	35	INDEX WAS 30 MB LARGER FOR CONVENTIONAL LOAD. THIS SUGGEST SOME DEGREE OF FRAGMENTATION OCCURRED DURING LOAD WHICH WOULD REQUIRE WEEKLY INDEX MAINTENANCE
EMPTY TABLE	00:30:10	03:05:24	6,291,456	212	
3 MIL ROWS IN TABLE	00:22:52	01:33:15	3,145,728	106	HAD TO INCREASE THE SIZE OF THE INDEX TABLESPACE IN ORDER FOR THE NEW INDEX AND THE OLD INDEX TO MERGE AT THE END OF DIRECT LOAD.

FIG. 15

Replacement Drawings
Serial No. 09/471,777

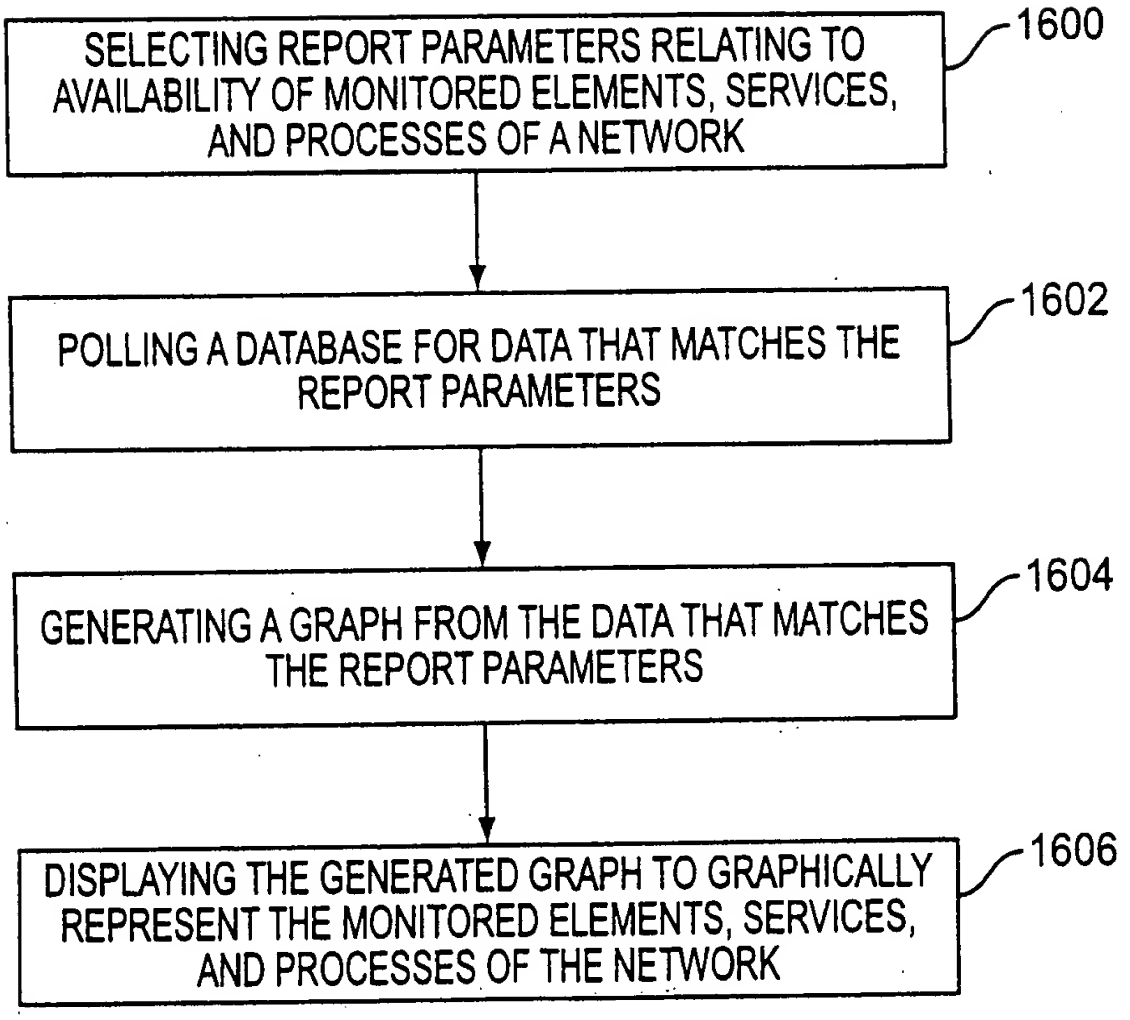

SELECTING REPORT PARAMETERS RELATING TO AVAILABILITY OF MONITORED ELEMENTS, SERVICES, AND PROCESSES OF A NETWORK
1600
POLLING A DATABASE FOR DATA THAT MATCHES THE REPORT PARAMETERS
1602
GENERATING A GRAPH FROM THE DATA THAT MATCHES THE REPORT PARAMETERS
1604
DISPLAYING THE GENERATED GRAPH TO GRAPHICALLY REPRESENT THE MONITORED ELEMENTS, SERVICES, AND PROCESSES OF THE NETWORK
1606

FIG. 16

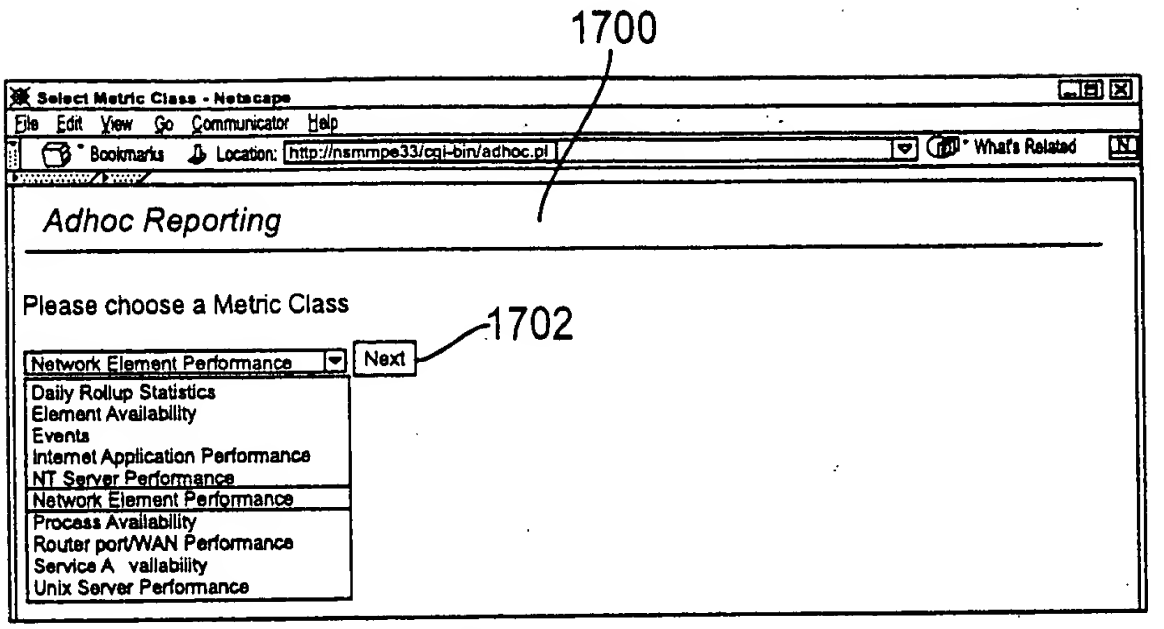


FIG. 17A

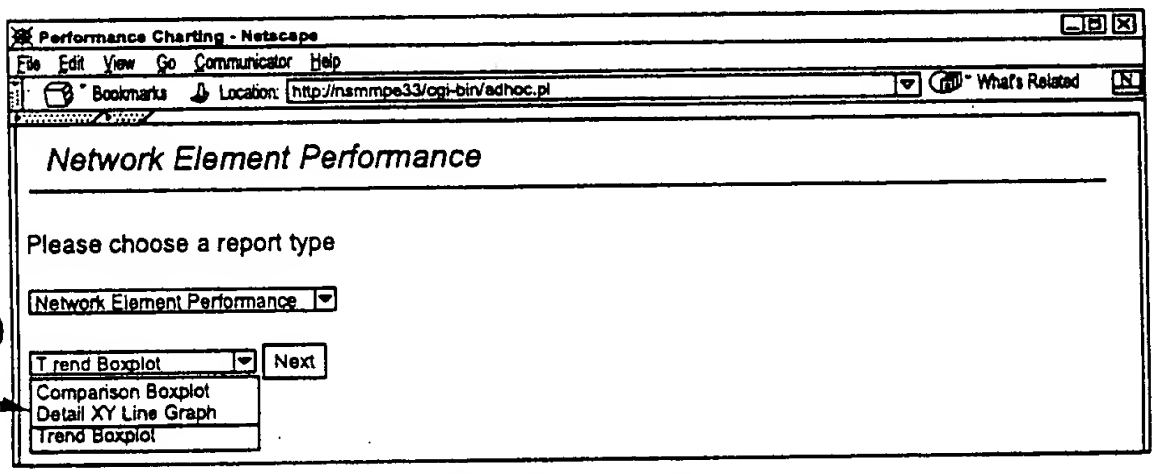


FIG. 17B

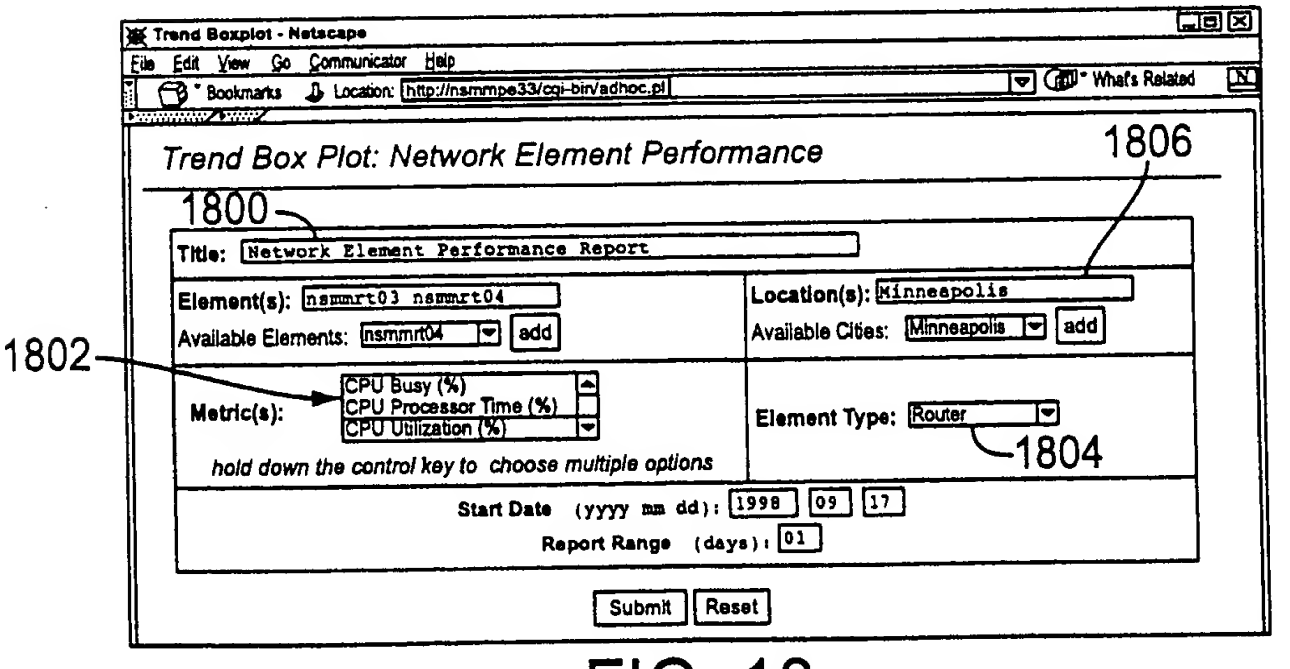


FIG. 18

Notes								
1. The Object and Report columns list all the daily batch report types required								
2. The total number of daily batch reports is listed in the column Batch Report Qty								
3. Each batch report is one of seven Generic Report Types detailed on sheet 2								
4. Data collection requirements driven by each report are given for Snmp and Patrol Metrics								
5. The reports marked with an asterisk (*) are optional for Phase 2								
Object	**Report**	**Generic Report Type**	**Graph type**	**y axis units**	**y axis range**	**x axis units**	**x axis range**	**Batch report qty**
Router, Cisco 7500	CPU Utilization Daily Detail	Daily detail	x-y line	%	0-100	hours	24	2
	CPU Utilization Daily Comparison	Daily comparison	boxplot	%	0-100	nodes	all routers	1
	CPU Utilization Trend	Monthly trend	boxplot	%	0-100	days	30	2
	Router Exceptions	Daily exception spectrum	spectrum	elements	all elements	hours	24	1
Router Interfaces/WAN	Interface Utilization Daily Detail	Daily detail, n sub-objects	x-y line	%	0-100	hours	24	2
	Interface Utilization Trend	Monthly trend	boxplot	%	0-100	days	30	4
	Interface Utilization Daily Detail	Daily detail, n sub-objects	x-y line	packets/sec	0-ifSpeed	hours	24	2
	Interface Utilization Trend	Monthly trend	boxplot	packets/sec	0-ifSpeed	days	30	4
	Response Time Daily Detail*	Daily detail, n sub-objects	x-y line	seconds	0-ifSpeed	hours	24	0
	Response Time Trend*	Monthly trend	boxplot	seconds	0-ifSpeed	days	30	0

FIG. 19A

	Naming standard:				
	<Description Units>				
	Database variable name				
Batch report requirements	y axis metric name	SNMP metrics	Patrol metrics	Patrol Collector	Max/Min Precision
Two router reports daily	CpuBusy_Percent	busyPer	N/A	N/A	
One report daily, comparing two routers	CpuBusy_Percent	busyPer	N/A	N/A	
Two router trend reports daily	CpuBusy_Percent	busyPer	N/A	N/A	
One report daily, showing exceptions for two routers	N/A	N/A	N/A	N/A	
Two router reports daily, each showing two interfaces	InterfaceUtilization_Percent	ifInOctects, ifOutOctets, ifSpeed	N/A	N/A	
Four interface reports daily	InterfaceUtilization_Percent	ifInOctects, ifOutOctets, ifSpeed	N/A	N/A	
Two router reports daily, each showing two interfaces	InterfaceUtilization_BPS	ifInOctets, ifOutOctets, ifSpeed	N/A	N/A	
Four interface reports daily	InterfaceUtilization_BPS	ifInOctets, ifOutOctets, ifSpeed	N/A	N/A	
	N/A	N/A	N/A	N/A	
	N/A	N/A	N/A	N/A	

FIG. 19B

Unix servers	CPU Utilization Daily Detail	Daily detail	x-y line	%	0-100	hours	24	1
	CPU Utilization Trend	Monthly trend	boxplot	%	0-100	days	30	1
	Memory Utilization Daily Detail	Daily detail	x-y line	bytes	0-100	hours	24	1
	Memory Utilization Trend	Monthly trend	boxplot	bytes	0-100	days	30	1
	Network I/O Daily Detail	Daily detail	x-y line	%	0-100	hours	24	1
	Network I/O Trend	Monthly trend	boxplot	%	0-100	days	30	1
	Disk Percent Busy Daily Detail	Daily detail	x-y line	%	0-100	hours	24	1
	Disk Percent Busy Trend	Monthly trend	boxplot	%	0-100	days	30	1
	Unix Exceptions	Daily exception spectrum	spectrum	elements	all elements	hours	24	1
NT servers	CPU Utilization Daily Detail	Daily detail	x-y line	%	0-100	hours	24	1
	CPU Utilization Trend	Monthly trend	boxplot	%	0-100	days	30	1
	Memory Utilization Daily Detail	Daily detail	x-y line	% or bytes	0-100	hours	24	1
	Memory Utilization Trend	Monthly trend	boxplot	% or bytes	0-100	days	30	1
	Network I/O Daily Detail	Daily detail	x-y line	packets/sec	0-100	hours	24	1
	Network I/O Trend	Monthly trend	boxplot	packets/sec	0-100	days	30	1
	Disk Percent Busy Daily Detail	Daily detail	x-y line	%	0-100	hours	24	1
	Disk Percent Busy Trend	Monthly trend	boxplot	%	0-100	days	30	1
	NT Exceptions	Daily exception spectrum	spectrum	elements	all elements	hours	24	1
Network Elements (all hardware)	Network Availability Bar Chart	Daily availability bar chart	bar	%	0-100	elements	all elements	1
	Network Availability Spectrum*	Daily availability spectrum	spectrum	elements	all elements	hours	24	0
Internet Services (fault mgmt)	Process Availability Bar Chart	Daily availability bar chart	bar	%	0-100	processes	all processes	1

FIG. 19C

One server report daily	CpuUtilization_Percent	N/A	CPUCpuUtil	VMColl	0/100 - #.###
One server report daily	CpuUtilization_Percent	N/A	CPUCpuUtil	VMColl	0/100 - #.###
One server report daily	MemoryFree_Pages	N/A	MEMFreeMem	VMColl	0/+ - #.###
One server report daily	MemoryFree_Pages	N/A	MEMFreeMem	VMColl	0/+ - #.###
One server report daily	NetworkTraffic_PPS	N/A	NETPacketsIn, NETPacketsOut	NETColl	0/+ - #.###
One server report daily	NetworkTraffic_PPS	N/A	NETPacketsIn, NETPacketsOut	NETColl	0/+ - #.###
One server report daily, showing two disks	DiskBusy_Percent	N/A	DSKPercentBusy		0/100 - #.###
One report daily, showing two disks	DiskBusy_Percent	N/A	DSKPercentBusy		0/100 - #.###
One report daily, showing exceptions from two servers	N/A	N/A	N/A	N/A	
One server report daily	CpuProcessorTime_Percent		CPUprcrProcessorTimePercent	CPUProcessorColl	0/100 - #.###
One server report daily	CpuProcessorTime_Percent		CPUprcrProcessorTimePercent	CPUProcessorColl	0/100 - #.###
One server report daily	MemoryFree_Mbytes		MEMmemAvailableBytes	MEMMemoryColl	0/+ - #.###
One server report daily	MemoryFree_Mbytes		MEMmemAvailableBytes	MEMMemoryColl	0/+ - #.###
One server report daily	NetworkTraffic_PPS		NETniPcktsPerSec	NETNetworkInterfaceColl	0/+ - #.###
One server report daily	NetworkTraffic_PPS		NETniPcktsPerSec	NETNetworkInterfaceColl	0/+ - #.###
One server report daily, showing two disks	DiskTime_Percent		PDpdDiskTimePercent	PDPhysicalDiskColl	0/100 - #.###
One server report daily, showing two disks	DiskTime_Percent		PDpdDiskTimePercent	PDPhysicalDiskColl	0/100 - #.###
One report daily, showing exceptions from two servers	N/A	N/A	N/A	N/A	N/A
One report showing all elements	N/A	N/A	N/A	N/A	N/A
One report showing all elements	N/A	N/A	N/A	N/A	N/A
One report showing 5 ISP apps	N/A	N/A	N/A	N/A	N/A

FIG. 19D

	Process Availability Spectrum*	Daily availability spectrum	spectrum	processes	all processes	hours	24	0
	Service Availability Bar Chart	Daily availability bar chart	bar	%	0-100	services	all services	1
	Service Availability Spectrum*	Daily availability spectrum	spectrum	services	all services	hours	24	0
All objects (fault mgmt)	Daily Exception Report	Textual list of all events	text	N/A	N/A	N/A	N/A	1
	FTP Response Time Daily Detail*	Daily detail	x-y line	seconds	0-max value			0
	FTP Response Time Trend*	Monthly trend	boxplot	seconds	0-max value			0
	SMTP Response Time Daily Detail*	Daily detail	x-y line	seconds	0-max value			0
	SMTP Response Time Trend*	Monthly trend	boxplot	seconds	0-max value			0
	NNTP Response Time Daily Detail*	Daily detail	x-y line	seconds	0-max value			0
	NNTP Response Time Trend*	Monthly trend	boxplot	seconds	0-max value			0
	HTTP Response Time Daily Detail*	Daily detail	x-y line	seconds	0-max value			0
	HTTP Response Time Trend*	Monthly trend	boxplot	seconds	0-max value			0
							Total	40

FIG. 19E

One report showing 5 ISP apps	N/A	N/A	N/A	N/A	N/A
One report showing 5 ISP apps	N/A	N/A	N/A	N/A	N/A
One report showing 5 ISP apps	N/A	N/A	N/A	N/A	N/A
One report daily showing all events	N/A	N/A	N/A	N/A	N/A
One report daily	FtpResponseTime_Seconds	N/A	ftpResponseTime	ftpMonitor	
One report daily	FtpResponseTime_Seconds	N/A	ftpResponseTime	ftpMonitor	
One report daily	SmtpResponseTime_Seconds	N/A	smtpResponseTime	smtpMonitor	
One report daily	SmtpResponseTime_Seconds	N/A	smtpResponseTime	smtpMonitor	
One report daily	NntpResponseTime_Seconds	N/A	nntpResponseTime	nntpMonitor	
One report daily	NntpResponseTime_Seconds	N/A	nntpResponseTime	nntpMonitor	
One report daily	NntpResponseTime_Seconds	N/A	nntpResponseTime	nntpMonitor	
One report daily	HttpResponseTime_Seconds	N/A	httpResponseTime	httpMonitor	
One report daily	HttpResponseTime_Seconds	N/A	httpResponseTime	httpMonitor	

FIG. 19F

NOTES						
1. "Object" may refer to an element, process, or service.						
Generic Report Type	**Graph Type**	**Description**	**Scope**	**X-axis Units**	**X-axis Range**	**Y-axis Units**
Daily Detail	XY line graph	Shows all samples of a single metric from a single object over one day	1 object, 1 metric	Hours& minutes	24 hours	Metric value
Daily Detail, N Sub-objects	XY line graph	Shows all samples of multiple metrics from a single object over one day	n objects, 1 metric	Hours & minutes	24 hours	Metric value
Daily Object Comparison	Boxplot	Compares distributions of a single metric across multiple objects for one day	n objects, 1 metric	Objects	n objects	Metric value
Monthly Trend	Boxplot	Shows changes in distributions of a single metric over one month	1 object, 1 metric	Days	30 days	Metric value
Daily Availability Bar Chart	Bar Graph	Compares percent availability for multiple services or objects for one day	n objects, 1 availability	Objects	n objects	Percent
Daily Exception Spectrum	Spectrum	Shows exceptions for multiple objects as points over time.	n objects, n exceptions	Hours & minutes	24 hours	Objects
Daily Exception Text Report	Text List	Text list of all events over one day, with columns for date-time, event string, code, and severity.	n objects, n exceptions	N/A	N/A	N/A
Daily Availability Spectrum*	Spectrum	Shows up/down status as a continuous color-coded lineover time: red=down, green=up.	n objects, 1 availability	Hours & minutes	24 hours	Objects

FIG. 20

1st Menu choice	2nd menu choice	3rd menu choice	4th menu choice	5th menu choice	6th menu choice	7th menu choice	Metrics(s)
Select Metric Class	Select Report Type	Select Element(s)	Select Location(s)	Select start date	# of days		
default	N/A	all	all	yesterday	1		
Element Availability	Percent Availability Bar Graph	<element name>	<element location>	<start date>	<days>		N/A
Service Availability	Percent Availability Bar Graph	<element name>	<element location>	<start date>	<days>	<service>	N/A
Process Availability	Percent Availability Bar Graph	<element name>	<element location>	<start date>	<days>	<process>	N/A
Events	Exception Spectrum	<element name>	<element location>	<start date>	<days>		N/A
Network Element Performance	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>		Cpu Utilization (busyper)
	Trend Boxplot	<element name>	<element location>	<start date>	<days>		Cpu Utilization (busyper)
	Comparison Boxplot	<element name>	<element location>	<start date>	<days>		Cpu Utilization (busyper)
Router port/WAN Performance	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>	<instance>	Interface Utilization (ifIn/OutOctects)
	Trend Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Interface Utilization (ifIn/OutOctects)
	Comparison Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Interface Utilization (ifIn/OutOctects)
Unix Server Performance	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
	Trend Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
	Comparison Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
NT Server Performance	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
	Trend Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
	Comparison Boxplot	<element name>	<element location>	<start date>	<days>	<instance>	Cpu Utilization, Memory Utilization, Network Utilization, Disk Percent Busy
Internet Application Performance*	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>		Response Time
	Trend Boxplot	<element name>	<element location>	<start date>	<days>		Response Time
	Comparison Boxplot	<element name>	<element location>	<start date>	<days>		Response Time
Daily Rollup Statistics	Detail XY Line Graph	<element name>	<element location>	<start date>	<days>	<metric name>	<rollup statistic> (min, max, mean, std dev, sample size)

FIG. 21

SNMP/PATROL METRICS	DESCRIPTION	PLATFORMS	UNITS	
busyPer	Provides the percent of CPU usage over the first 5 second period in the scheduler.	Router	percentage	
ifInOctets	The total number of octets received on the interface, including framing characters.	Router Interface	octets	
ifOutOctcets	The total number of octets transmitted out of the interface, including framing characters.	Router Interface	octets	
ifSpeed	An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.	Router Interface	bits per second	
CPUCpuUtil	Displays the percentage of CPU utilization.	UNIX	percentage	
MEMFreeMem	Displays the number of pages of memory available.	UNIX	pages	
NETPacketsIn	Displays the total number of incoming packets within a sample interval.	UNIX	packets	
NETPacketsOut	Displays the total number of outgoing packets within a sample interval.	UNIX	packets	
DSKPercentBusy	Displays the percentage of time that the device is busy servicing a transfer request.	UNIX	percentage	
CPUprcrProcessorTimePercent	Displays a percentage of the elapsed time that a processor is busy executing a non-idle thread.	NT	percentage	
MEMmemAvailableBytes	Displays the size of the virtual memory currently on the zeroed, free, and standby memory lists.	NT	megabytes	
NETniPcktsPerSec	Displays the rate that the packets are sent and received on the network.	NT	packets per second	
PDpdDiskTimePercent	Displays the percentage of elapsed time that the disk spends servicing read or write requests.	NT	percentage	

FIG. 22

Replacement Drawings
Serial No. 09/471,777

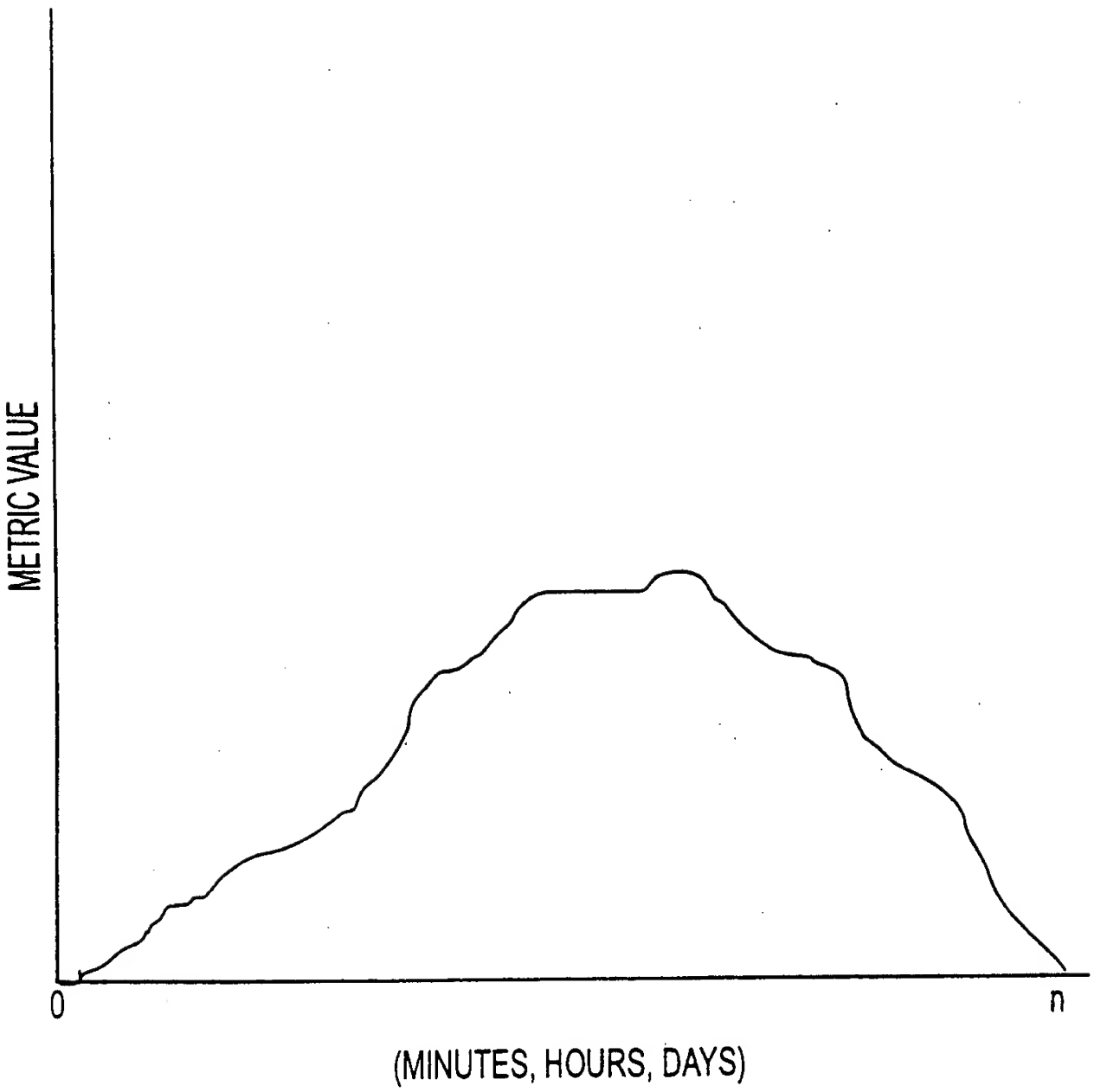


FIG. 23

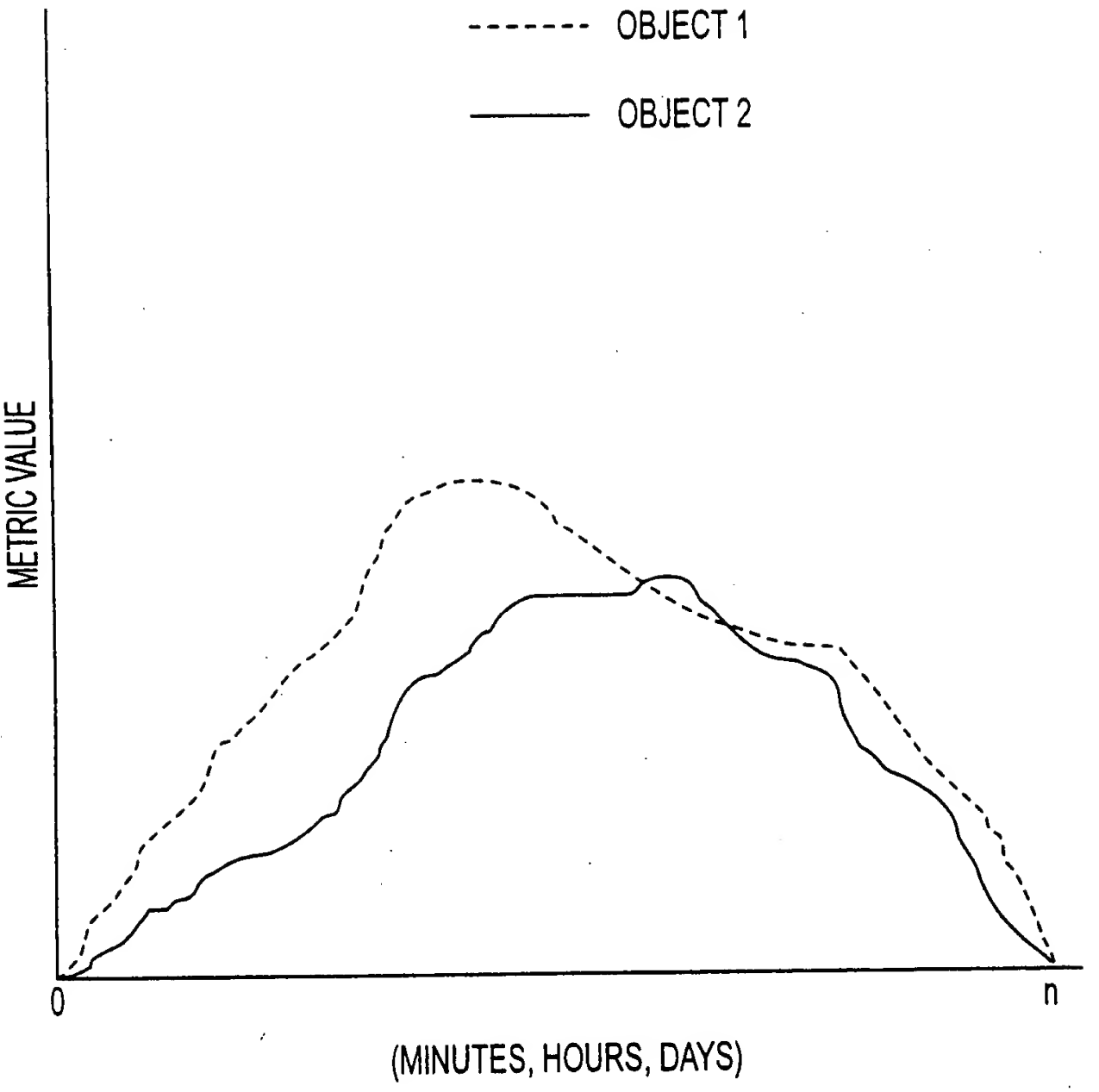


FIG. 24

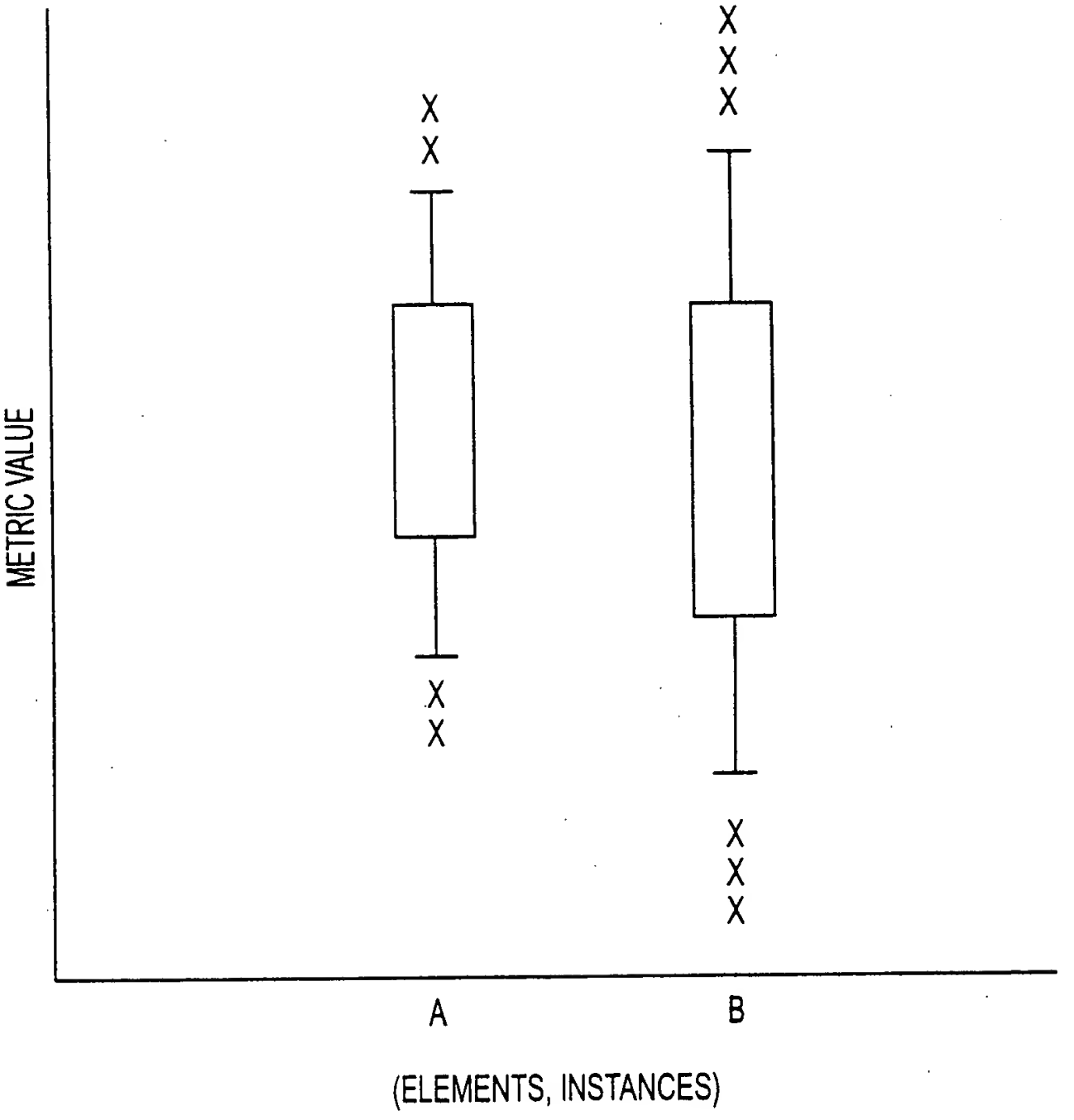


FIG. 25

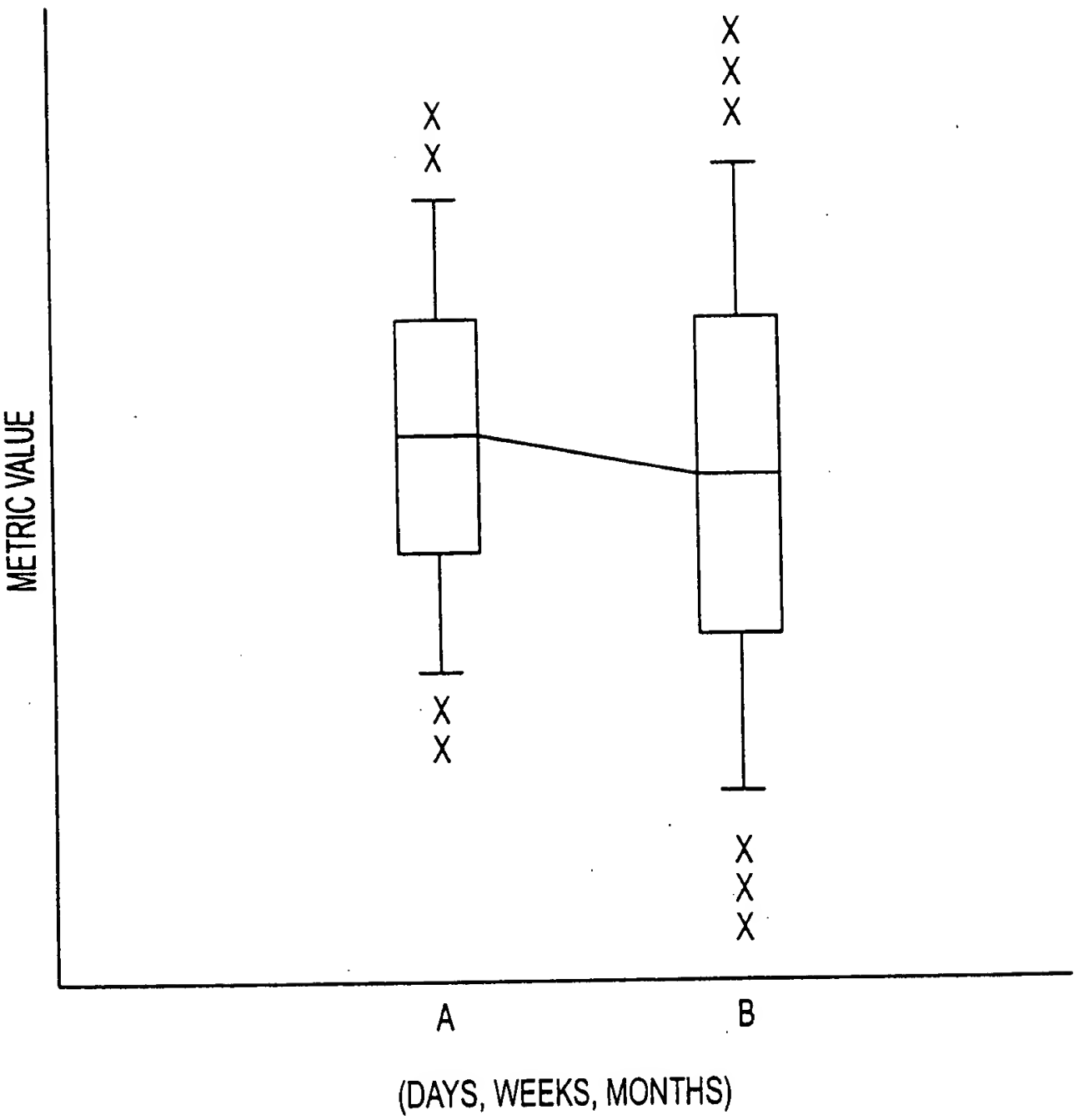


FIG. 26

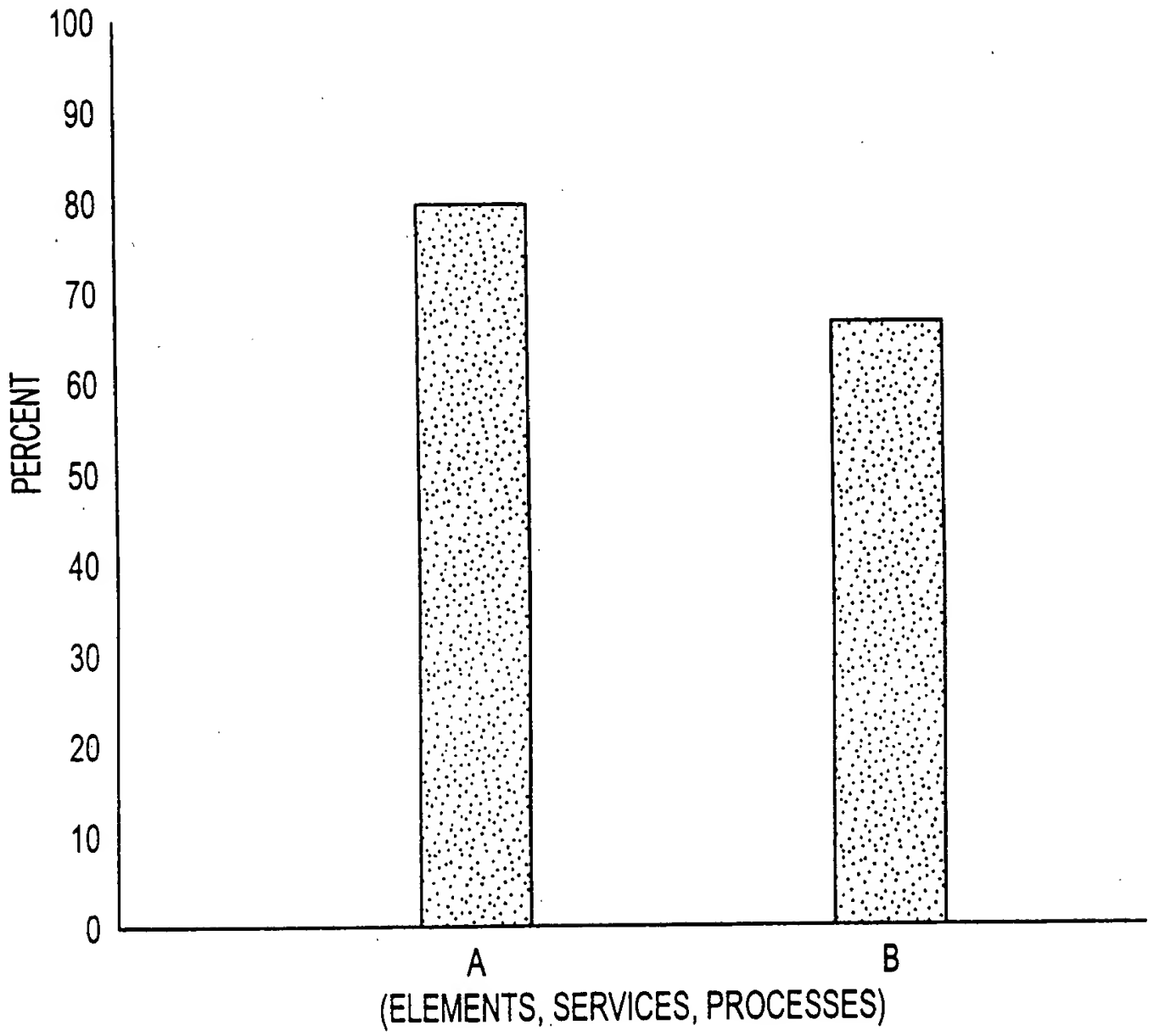

100
90
80
70
60
50
40
30
20
10
0
PERCENT
A
B
(ELEMENTS, SERVICES, PROCESSES)

FIG. 27

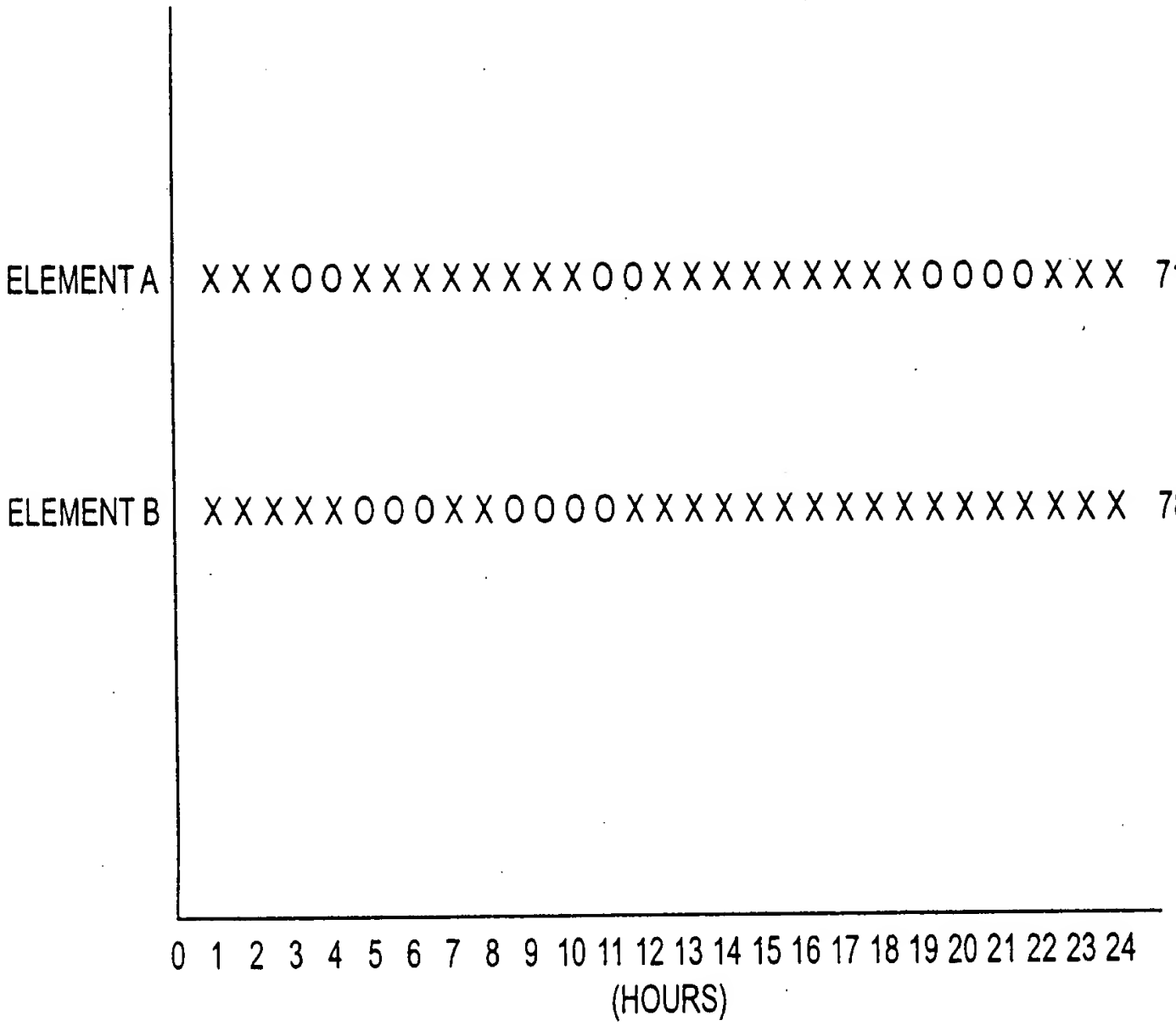

ELEMENT A
X X X O O X X X X X X X O O X X X X X X X X O O O O X X X
71%
ELEMENT B
X X X X X O O O X X O O O O X X X X X X X X X X X X X X X
78%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
(HOURS)

FIG. 28

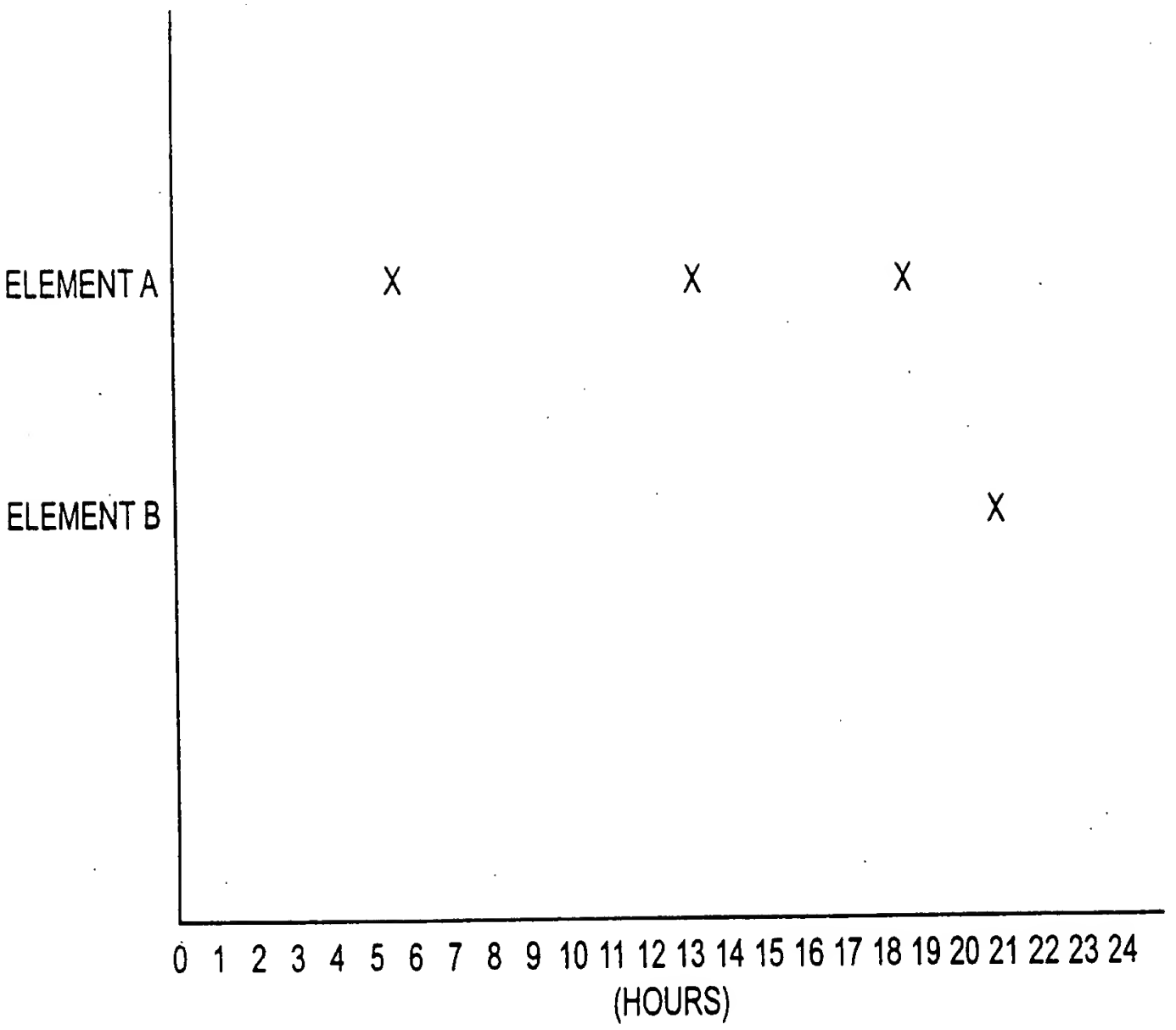

ELEMENT A
X
X
X
ELEMENT B
X
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
(HOURS)

FIG. 29

Date-Time	Element	Event string	Duration	Severity
01/12/1998 06:34:12	nsmmws16	CPU Utilization over 80%		Critical
01/12/1998 08:01:23	nsmmws09	Host down	3:24:43	Critical
01/12/1998 16:54:52	twmmnt02	FTP service down	0:19:42	Critical

FIG. 30

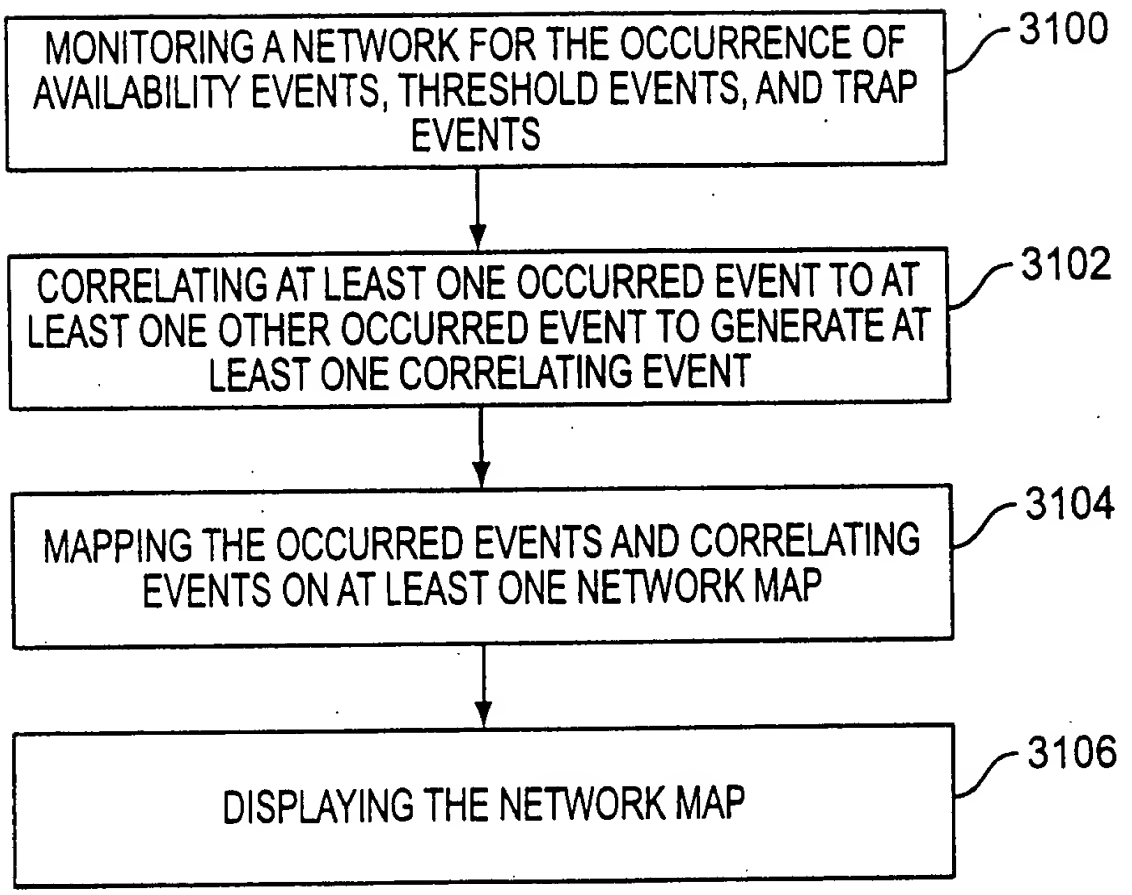
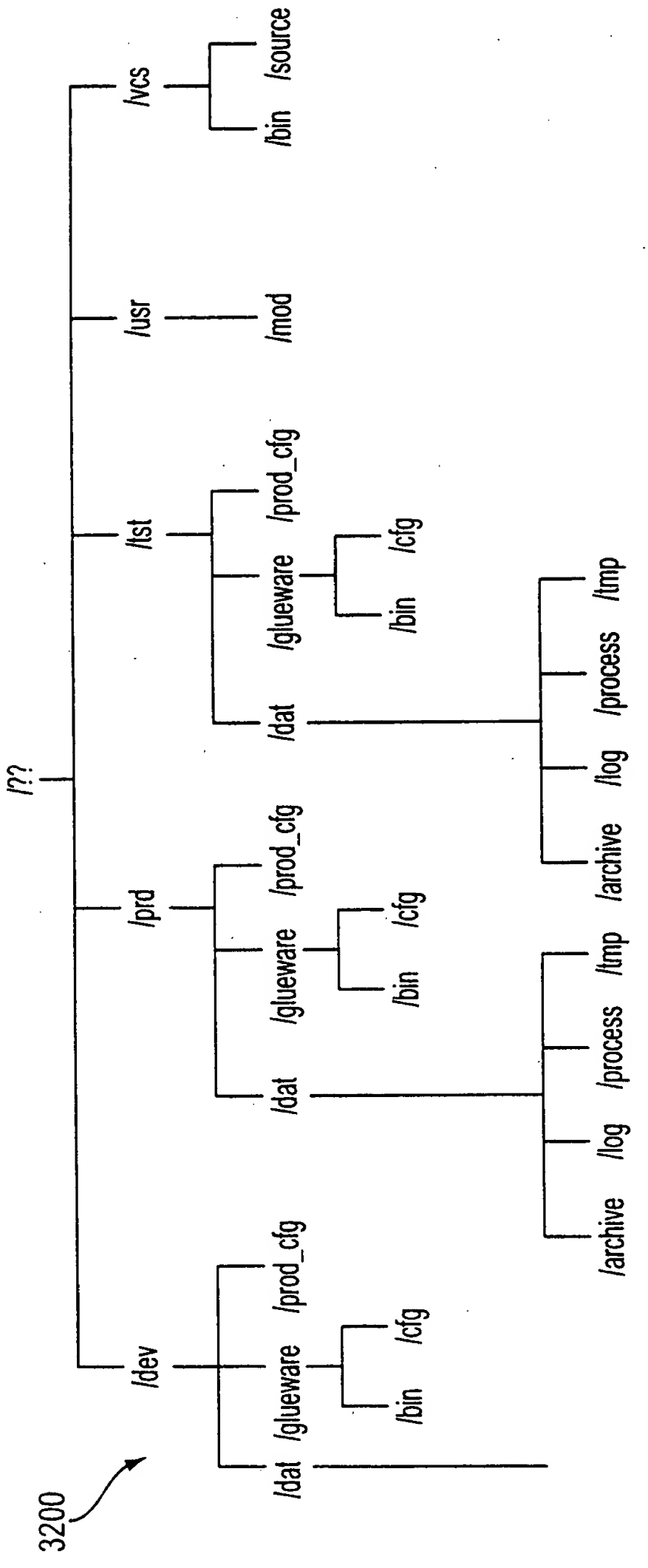

MONITORING A NETWORK FOR THE OCCURRENCE OF AVAILABILITY EVENTS, THRESHOLD EVENTS, AND TRAP EVENTS
3100
CORRELATING AT LEAST ONE OCCURRED EVENT TO AT LEAST ONE OTHER OCCURRED EVENT TO GENERATE AT LEAST ONE CORRELATING EVENT
3102
MAPPING THE OCCURRED EVENTS AND CORRELATING EVENTS ON AT LEAST ONE NETWORK MAP
3104
DISPLAYING THE NETWORK MAP
3106

FIG. 31



CURRENT SETTINGS/VALID VALUES

Directory structure will be stored on ucmmfs02
The directory /sa will be the mount point to nsmmws09, nsmmws16, and twmmdb02
Files owned by with group of twsa

FIG. 32